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Original Communications.

*CLINICAL THERAPEUTICS—LECTURES ON THE TREATMENT OF HEPATIC AFFECTIONS.**

LECTURE IV.—ON THE BILIARY LIVER.

BY PROFESSOR DUJARDIN-BEAUMETZ,† PARIS, FRANCE.

GENTLEMEN:—In the last lecture I considered the liver from the point of view of the secretion of bile, and presented the most recent data of physiology on the biliary liver. I desire to devote this lecture to the therapeutic consequences which flow from the facts which I have stated.

I cannot attempt to take up all the problems connected with the therapeutics of the biliary passages, and shall speak of only three important points pertaining to this subject,—the treatment of biliary lithiasis; the new notions which have arisen respecting the different kinds of jaundice, and, in particular, infectious jaundice; and, lastly, I shall have a few words to say about urticaria of hepatic origin.

The treatment of biliary lithiasis was made the subject of very interesting and very important communications to the Congress which was held during April of the present year at Wiesbaden. On the one hand, the pharma-

* From advance sheets, revised by the author (translated by E. P. Hurd, M.D.). Lectures delivered in Cochin Hospital, Paris, France.

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ceutical treatment received the addition of a new medicament for renal colic,—namely, olive oil; and, on the other, surgeons, more sanguine than ever over their new antiseptic methods, claimed the ability to treat this disease still more successfully by a cutting operation. It is on the sum of these data, and on facts which you have been able to observe in my hospital service, that I base the exposition which I am about to make of the new treatments of biliary lithiasis.

In his remarkable report to the Congress of Internal Medicine of German physicians, Naunyn, of Strasburg, showed on what fragile bases all the chemical theories rest which have been invoked to explain the precipitation of cholesterin in the bile. Authorities have, in fact, maintained that, if cholesterin, which constitutes the basis of biliary calculi, undergoes precipitation in the bile, this results from an increase of the percentage amount of this substance in that fluid. This is not the case, for the experiments of Thomas have shown that cholesterin undergoes neither augmentation nor diminution in the bile, and keeps at an almost constant percentage figure, notwithstanding the kind of diet employed.

As cholesterin belongs to the fatty series, its increase in the bile, according to many authorities, is due to a diet too rich in carbohydrates, or, possibly, to an incomplete combustion of these carbohydrates. Hence, in logical accordance with this notion, they counselled the suppression of fats and other hydrocarbonaceous aliments from the food of individuals affected with gall-stones. To-day it is necessary absolutely to abandon this idea, and we shall see that if there is any special alimentary hygiene to be imposed on patients affected with biliary lithiasis, it should be established on other bases.

Other authorities in physiological chemistry, to explain the precipitation of cholesterin, have hypothecated modifications supervening in the bile. Thus it is that Thudichum has maintained that the decomposition of glycocholic acid into cholalic acid explains the setting free of cholesterin. Others have hypothecated the presence of calcareous salts. None of these theories have been verified by experiment.

There is even another view, which would derive cholesterin from the exaggerated functionating of the cerebro-spinal axis. We must make *carte-blanche* of all these theories, and base ourselves henceforth on clinical examinations. These examinations have shown us two great facts,—the one, which has been clearly set forth by Naunyn, that we always find as nucleus of the calculi epithelial *débris* shed by the mucous membrane of the altered biliary passages; the other fact, which, in my judgment, has not been sufficiently emphasized by Naunyn, is the stasis of the bile in the gall-bladder. Let us examine each of these facts.

The presence of epithelial *débris* as nuclei of the calculi is an evident proof that the latter are formed almost always as the sequel of an inflammation of the excretory bile-ducts, including the gall-bladder, an inflammation to which Naunyn gives the characteristic name of *desquamative angiocholitis*. Whence comes this angiocholitis? It results from the propagation of gastro-duodenal inflammation to the bile-ducts. We may even add that it is an *infectious* inflammation of these ducts, and I shall again return to this subject when I come to speak of infectious jaundice. And now, as for this gastro-duodenal inflammation, whence does it arise? It results either from too abundant a diet, or from irritating articles of diet, or from the food being habitually badly masticated, and a sound alimentary hygiene will address itself to the different points which I have just mentioned.

Stasis of the bile in the gall-bladder is a cause of biliary calculi quite as important as desquamative angiocholitis; the one completes the other. First, angiocholitis prevents the free outflow of the bile, and consequently causes its stasis in the gall bladder. Want of exercise, and especially wearing the corset, by immobilizing the liver, explains why we so frequently meet with biliary lithiasis in women. Lastly, irregularity of meals plays also a part in this retention of bile.

Do not, in fact, forget that in the physiological state, in each movement of inspiration we depress the liver upon the intestinal mass, and thereby exercise a pressure more or less energetic on the gall-bladder; and, as in the male, the respiration is chiefly diaphragmatic and inferior-costal, while in the woman it is chiefly superior-costal, if you add to this latter mode of respiration the use of the corset, you readily understand why biliary lithiasis is so frequent in women.

As for the influence of meals, physiology shows us that two hours after a meal the gall-bladder tends to empty itself.

It is, then, on these two bases—diet and exercise—that we must henceforth establish the hygienic treatment of patients affected with biliary lithiasis.

In respect to diet, we shall have to examine

successively the choice of foods, the interval between the meals, and the duration of the latter. As I have just said to you, in the choice of foods, you must abandon absolutely the proscription heretofore made to gall-stone patients of fatty and hydrocarbonaceous aliments. You will permit these articles of diet in moderation. But you will absolutely forbid all irritating ingesta, and as gastro-duodenitis always precedes desquamative angiocholitis as the cause of the calculi, you will endeavor to combat the first symptoms of this gastro-enteritis by a diet as simple as possible.

You will find the bases of this diet in a vegetarian regimen. Do not, in fact, forget that this duodenal inflammation follows an exaggerated acidity of the gastric juice, and that this acidity is itself produced by the abuse of azotized food. You will then resolutely interdict animal food, and subject your patients to a diet composed of eggs, amylaceous substances, green vegetables, and fruits, and if you permit meats, you will authorize only those that are well cooked and gelatinous.

In fact, to the inflammation, which is the cause of this angiocholitis, we must add the infection due to the penetration of the microbes of the intestine into the bile-ducts. Putrescible meats, as game, fish, mollusks, and crustaceans, being factors of this infection of the bile-ducts, should be absolutely proscribed. As for beverages, you ought to be uncompromisingly severe in the prohibition of all alcoholic stimulants, alcohol being one of the most frequent causes of gastro-duodenitis, and insist on the use of water or of milk; and to patients who cannot endure the complete suppression of alcohol, you will allow a little white wine diluted with water, or an occasional teaspoonful of good brandy in a glass of water.

Alkaline waters, which have so favorable an action in the treatment of biliary lithiasis, are here almost obligatory. There has been a great deal of discussion respecting the therapeutic action of these waters. We have seen in a previous lecture that the alkaline waters are not cholagogue. It is not, then, by the augmentation of the biliary secretion that we can explain their curative action. In my opinion their therapeutic effects must be attributed principally to the power which they possess of diminishing the gastro-enteritis by decreasing the acidity of the gastric juice.

It is not enough to have prescribed a vegetable diet, abstinence from alcoholic drinks, and the usage of alkaline waters, you must also require of the patient that he shall devote a sufficient time to his meals, so that mastication may be completely and slowly effected. Mialhe, many years ago, advanced the opinion that all kinds of dyspepsia were due to insufficient mastication. Without going to this length, we may say, however, that the presence of aliments badly masticated is one of the most frequent causes of gastro-duodenitis. The undigested bolus constitutes a veritable foreign body, which irritates the pyloric region of the stomach and the mucous membrane of the duodenum. It is the same with too great a quantity of any kind of food. Large, gluttonous eaters, who bolt their food, are very subject to gastritis. It is necessary to eat reasonably and to masticate slowly.

As for the interval between meals, it is desirable that the meals should be brought rather nearer together than in health, as we know that each meal aids the gall-bladder in emptying itself. You will then allow the patient, besides breakfast and dinner, to take a little food on rising and about three o'clock in the afternoon, so that he may have four meals a day,—two large ones and two small ones. Be it understood that this prescription does not apply to persons with dilated stomachs, who constitute (it must be acknowledged) a considerable percentage of gall-stone patients.

This fact—*i.e.*, the frequency of biliary lithiasis in patients affected with dilatation of the stomach—is easily explained, when we consider that they have often, besides gastritis, an irritation of the duodenum, and that very often there exists, superadded, an infection of the bile-passages, circumstances all of which are favorable to the development of desquamative angiocholitis.

So much for the dietetic prescriptions to be enjoined. They are, as you see, almost all based on the knowledge of the gastro-duodenitis and consecutive angiocholitis.

With regard to the stasis of the bile, you can combat this second cause by different means, some of which belong to pharmacy, others to hygiene. As for the pharmaceutical treatment, it is to cholagogue medicines that you should resort, and I would recommend to you especially euonymin and salicylate of sodium.

I was one of the first to make known the favorable action of euonymin, and my first trials were recorded in the thesis of one of my pupils, Dr. Davet.*

The formula which I ordinarily employ is as follows:

* Davet, *Thèse de Paris*, 1880.

Euonymin,
Castile soap, aa 10 centigrammes.
For one pill.

The ordinary dose would be two pills.

Salicylate of sodium is also a good cholagogue, and I often administer to patients affected with biliary lithiasis a dessertspoonful after meals of the following solution :

℞ Salicylate of sodium, 15 grammes;
Water, 250 grammes. M.

Salol, associated with salicylate of bismuth, is also a powerful cholagogue. You can use the formula of my antiseptic intestinal *cachets*, which is as follows :

℞ Salol,
Salicylate of bismuth,
Bicarbonate of soda, aa 10 grammes. M.
Sig.—Make into thirty medicinal wafers (*cachets médicamenteux*).

Laxatives also play an important *rôle* in the treatment, and you can employ podophyllin or cascara, or the sodic-sulphate purgative waters, such as Rubinat, Villacabras, and Carabana.

Lastly, do not forget that large rectal injections have a cholagogue action ; this is Krüll's method. You can here make use of enteroclysm and the naphthol solutions of which I have spoken in a previous lecture.

Next come the hygienic methods. I have said that respiration favors the flow of bile, by depressing the liver upon the intestinal mass, and thereby exercising pressure on the gall-bladder. You should, then, make your patients take full, deep inspirations, and for this purpose you cannot do better than recommend respiratory gymnastics. One of the most simple methods of carrying out this kind of gymnastics consists in making your patient count in a loud tone of voice without taking breath.

It is well understood that in the case of your female patients you will make the sometimes difficult requirement that they shall wear their corsets rather loose, while men should be interdicted in the use of the waistband and the wearing of tight suspenders. Lastly, long walks and other bodily exercises, by energizing the respiratory movements, are powerful adjuvants to this kind of treatment.

In the performance of these exercises a real massage of the gall-bladder is produced. One may also, with the hand, and by following the practices which I have set forth in my "Hygienic Therapeutics," in the lecture on "Massage" (see THERAPEUTIC GAZETTE, 1887, p. 577), accomplish, by the aid of abdominal massage, a direct pressure over the base of the gall-bladder.

Lastly, hydrotherapy, in giving to the muscular system a better tone, should be advised in these cases.

Such are the general rules and principles that you should follow in the treatment of biliary calculi. You know, however, that this treatment comprehends two great indications,—first, to oppose the production of calculi ; then to combat, not their expulsion, but the painful symptoms that accompany them, and whose sum constitutes what has been described under the name of hepatic colic.

I have accomplished the first part of my task, and I will now take up the second,—*i.e.*, the treatment of the painful phenomena which constitute the hepatic colic. I shall review only the principal points pertaining to the subject, referring you for a more complete exposition thereof to my "Clinique Thérapeutique" (*vide* "Diseases of the Liver," American edition). It is now an accepted fact that one of the best means of combating that reflex spasm which has for its origin the irritation of the mucous membrane of the bile-ducts is the injection of morphine. In these cases you can make use of the combination of morphine and atropine, as in the following formula :

℞ Sulphate or hydrochlorate of morphine, 10 centigrammes;
Sulphate of atropine, 1 centigramme;
Sterilized water, 20 grammes.

The dose of the above would be one hypodermic syringeful.

But I desire to call your attention particularly to a new medicinal agent. I refer to olive oil. It is to the homœopathic physicians, who have, it must be admitted, introduced a number of new medicines into the materia medica, that we are indebted for our knowledge of the utility of olive oil given in large doses as a remedy for hepatic colic. It is now almost twenty years that this treatment has been in vogue. In recommending olive oil in this affection, it might seem that they were in part faithful to their doctrine, in combating gall-stones constituted essentially by cholesterin, a fatty body, by another fatty body,—*similia similibus*. At the same time note that they employed it in large doses, which is hardly consistent with the Hahnemannian doctrine.

From the United States, this method passed

over to England, and was there adopted by several regular physicians, and among them Kennedy, Thompson, and Singleton Smith.

In France, it was not till after the publication of Touâtre, in 1887, that we commenced using this remedy, and Chauffard and Dupré, in 1888;* Martial Durand, of Bordeaux, in 1889;† Huchard,‡ Germain Sée,§ and Marciguey,‖ in turn published favorable results.

All these clinical facts have, moreover, been summed up in an excellent paper by one of my pupils, Dr. Willemin,¶ of Vichy, from which I borrow the more important points respecting this mode of treatment.

To-day the facts are sufficiently numerous to warrant us in affirming that olive oil in large doses is one of the best means of combating the painful phenomena determined by the presence of calculi. It arrests almost instantly the severe acute pains, and diminishes considerably the period during which the patients suffer dull pains, prostration, and discomfort.

Failure constitutes the exception, and what is strange, the large quantity of oil is well borne and the patients do not vomit. I say large quantity, for you must give in one dose 200 grammes (or nearly a tumblerful) of pure olive oil, and, in order to do away with its disagreeable taste, you can order the patient to rinse the mouth with brandy and water, or to suck a little orange juice. In my own practice, to the olive oil I add bile, and with two hundred grammes of oil I combine twenty grammes of ox-gall. This mixture is slightly bitter, but it is well tolerated by the patient, and the results have been the same as with the oil, so that it is difficult for me to credit to the bile what really belongs to it in these cases. I was led to employ ox-gall by the researches of Prevost and Binet, who have shown that this substance is a powerful cholagogue.

We are still ignorant of the real mechanism of the therapeutic action of olive oil. Touâtre maintains that the oil always causes expulsion of the calculi. We know to-day the cause of this mistake. Touâtre confounded with gall-stones certain oily concretions resulting from the incomplete digestion of the ingested oil.

It is difficult to admit that the oil acts directly on the calculi, for we cannot conceive of its passing into the bile-ducts. Stewart maintained that the oil broke up into fatty acids and glycerin, and that the latter produced in the intestines reflex movements favoring the issue of the calculus. Others, and in particular Rosenberg, considered the oil as a powerful cholagogue, and it is this cholagogue action which explains the favorable effects of the oil.

Lastly, we may suppose that the oil has a direct action on the orifice of the ductus communis choledochus and corresponding duodenal region, which tends to diminish the reflex spasm, which is the first cause of the colic.

For my part, I am ready to adopt the opinion of Willemin, who thinks that the large doses of oil act in several ways,—first, as a cholagogue, then in diminishing the reflex action, and lastly in favoring the descent of the calculus into the intestine by their laxative properties.

However this may be, the number of favorable facts is to-day so considerable that, before having recourse to the injections of morphine, you ought always to make your gall-stone patients take a full dose of 200 grammes of olive oil, with or without the addition of the ox-gall.

It remains for me, in concluding, to say something about surgical intervention in cases of biliary lithiasis. Fortified and protected by antisepsis and asepsis, abdominal surgery has taken of late years a very wide extension, and operations are now performed on the liver which years ago were never thought of. Surgeons have freely opened abscesses of the liver. They have even resected portions of the organ; but the most brilliant operations have been performed on the gall-bladder, which has sometimes been cut open for the extraction of gall-stones (cholecystotomy), sometimes completely extirpated (cholecystectomy), a much more dangerous operation than the other.

The first attempts of the kind, made by Lawson Tait and Langenbeck, were so successful that these operations became popular, and were performed by surgeons in different countries; and in France the cases on record, by Terrillon, by Terrier, by Routier, and by

* *Bulletin de la Société Médicale des Hôpitaux de Paris*, October 24, 1888.

† Martial Durand, *Société Médicale de Bordeaux*, January 25, 1889.

‡ Huchard, *Revue de Clinique et de Thérapeutique*, December 3, 1890.

§ G. Sée, *Médecine Moderne*, January 23, September 11, and November 6, 1880.

‖ Marciguey, *Revue de Clinique et de Thérapeutique*, 1889.

¶ Willemin, "Traitement de la colique hépatique par l'huile d'olive" (*Bulletin de Thérapeutique*, t. CXX., 1891, pp. 241 and 308).

Perier, are sufficiently demonstrative to entitle these operations to a legitimate place in current surgical practice. Therefore, whenever, whether, by reason of a calculus or some morbid alteration of the bile-ducts, there exists an insurmountable obstacle to the outflow of the bile, and the latter accumulates in the gall-bladder and distends it so as to constitute a tumor which is sometimes mistaken for hydatid cysts, the duty of the physician is to call in the help of surgery to obtain the definite cure of the patient; and such surgical intervention will be in the great majority of cases followed by success.

I need not here give you the details of these surgical operations, but will refer you, therefor, to the new treatises on surgery, and it will be hard for you to find anything better on the subject than the recent article of Terrillon in the *Bulletin de Thérapeutique*.*

I have now finished what I intended to say on the treatment of biliary lithiasis, and I will now take up as briefly as possible the question of infectious jaundice.

To the chapter, already so extensive, of icterus in general must be added a new branch of medical study, which has come into being the last few years; I refer to infectious icterus. Guided by the new methods of investigation instituted by Pasteur, pathologists have sought to determine whether the bile contains micro-organisms or not, and in what way the latter may enter the bile. They have established the clinical symptomatology of this hepatic infection, the clinical syndrome that results therefrom, and have arrived at conclusions which concern clinical medicine and therapeutics.

You will find all these data set forth in their entirety in a very able thesis by Dr. Ernest Dupré.†

Bile, in its normal state, is devoid of microbes, and this, despite the presence of numerous micro-organisms existing in a permanent state in the duodenum and even as far as the ampulla of Vater; but in the pathological state the barrier there interposed is broken through, and the bile is then infected by numerous pathogenic microbes.

This infection may take place, as Dupré remarks, in five ways,—by the lymphatics, the arteries, the venous channels, and the bile-ducts.

Infection by the lymphatic vessels is extremely rare. As for infection by the hepatic artery, this sometimes takes place as a sequel of general pyæmia; this is the cause of abscesses of the liver, so frequent in purulent infection.

Infection by the vena portæ is the cause of the abscesses of dysentery. As for infection by the hepatic veins proper, it is very rare. Nevertheless, Widal, Achalme, and Claisse have reported several cases.

There remains the infection by the bile-ducts, which possesses by far the greatest interest, and which alone deserves to occupy our attention during the remainder of the lecture. Dupré has classified the biliary infections into primary and secondary, and the table which I here give you from his work is a good *résumé* of the divisions which he has adopted:

BILIARY INFECTIONS.

- Primary.
  - Acute.
    - Spontaneous, protopathic (series of infectious icterus).
    - Provoked, deuteropathic (biliary infections complicating general affections).
  - Chronic.
    - Chronic forms of icterus.
- Secondary.....
  - Intrinsic obstructions by
    - Foreign bodies (inert and living).
    - Calculi.
    - Cancer.
  - Extrinsic obstructions by
    - Tumors of the duodenum, of the pancreas, of the hilum of the liver, etc.

I cannot enter into a symptomatic detail of all these forms of icterus, but I must, however, call your attention to a primary, acute form, which is to-day designated under the name of Weil's disease, and which you will find described in a fine paper by Lancereaux,‡ a description which was written before the publication of Dr. Weil in 1886,§ as the article of Lancereaux bears date 1882.

Whether it be primary or secondary, the biliary infection gives rise to an aggregate of symptoms, of which fever is one of the most constant characters.

This fever is sometimes remittent, sometimes frankly intermittent, and it then presents the three stages of intermittent malarial fever. The accessions may even take

* Terrillon, "Chirurgie du foie" (*Bulletin de Thérapeutique*, t. cxx., 1891, p. 108).

† E. Dupré, "The Biliary Infections: a Bacteriological and Clinical Study" (*Thèse de Paris*, 1891).

‡ Lancereaux, "Des Ictères graves et des hépatites parenchymateuses," Leçon de la Pitié (*Revue de Médecine*, 1882).

§ Weil (Heidelberg), "Ueber eine eigenthümliche mit Milz Tumor, Icterus und Nephritis einhergehende acute Infectionskrankheit" (*Deutsche Klinische Medicin*, 1886, Band xxxiv. p. 209).

on the grave and pernicious form, and the patient succumbs during one of these attacks.

Against these forms of infectious icterus, whatever may be the origin, we are not altogether without therapeutic armor. It is especially to the antiseptic medication that you are to resort, and here you will witness the signal benefits of salol, of salicylate of bismuth, of intestinal irrigations with naphthol, and of an appropriate diet, of which milk should be the basis.

Do not, in fact, forget that in these patients we find a favorable prognostic indication in the abundance of the urine. The greater the amount of the urine voided in twenty-four hours the greater the chances of recovery; and you will obtain this diuretic action by making almost exclusive use of a milk diet. If I do not enter more into the detail of this antiseptic medication, it is because it is precisely like what I have before described.

Nevertheless, there is a medicament which should occupy an important place in the treatment of these cases of infectious icterus. In the previous lecture I showed you that on the experimental plane calomel is not a cholagogue, and the experiments of Prevost and Binet entirely confirm those of Rutherford and Vignal. The latter had proposed to substitute the bichloride of mercury for the protochloride; but, according to the Genevan experimenters, neither of the two salts of mercury can be considered as cholagogue.

At the same time, clinical medicine has shown all the benefits to be derived from calomel in certain hepatic affections, and in some countries, as in the United States and England, this medicament is in current use. I believe that we must explain the good effects of calomel in the treatment of hepatic affections by its antiseptic properties. It is a powerful microbicide, and you understand how, in the infectious hepatic affections secondary to intestinal affections, this medicament may render great service. Dr. Sacharjin has much vaunted the employment of calomel in such cases. He gives it in fractional doses of 1 centigramme (1/6 grain) seven times a day.*

At the same time I prescribe calomel with great moderation, for this reason, that I have sometimes seen patients salivated by its use.

You know that it is to-day demonstrated with almost absolute certainty that the transformation of calomel into corrosive sublimate under the influence of aliments containing common salt is much more difficult of production than was formerly thought. Hence we are not obliged to eschew the use during the administration of calomel of food that has been salted. With regard to the doses, you will have better results by giving massive doses of 7 to 15 grains, taking care always to watch the gums of your patients. You will, of course, cease giving the medicine if the least symptoms of gingivitis appear.

It remains for me, in concluding this already too long lecture, to say a few words about urticaria of hepatic origin.

You are all acquainted with urticaria of alimentary origin, whose most intense type is that which is observed after the ingestion of certain kinds of shell-fish, as clams and oysters. It has been affirmed that these urticarias are produced by a toxic substance contained in the liver of these mollusks, a toxine which Brieger has isolated, and to which he has given the name of *mitylotoxine*.

You know also that the same phenomena of poisoning may supervene after the puncture of hydatid cysts, and that it is probable that it is another toxine not yet isolated which causes this urticaria.

The same rash is seen in the period of convalescence of infectious icterus, and in particular of icterus by retention become infectious. At the moment when the bile is again poured into the intestine, eruptions of urticaria of great intensity are witnessed. These urticarias last a certain time, gradually fading away, to disappear altogether as the individual regains his health.

I explain these forms of icteroid-urticaria in this way: It is probable that the bile retained in the infected liver is the starting-point. This bile contains a great number of microbes and toxines, similar to those which develop in the liver of shell-fishes. This bile, which is poured in abundance upon the surface of the intestine at the moment when the obstacle is overcome, is reabsorbed, and then causes phenomena of poisoning, of which the nettle-rash is one of the manifestations.

Here, also, the only treatment of any use is intestinal antisepsis, which is applicable not only to these urticarias consecutive to infectious icterus, but to the greater part of urticarias in general, which are pathogenetic eruptions, as Bazin calls them,—*i.e.*, are dependent on blood-poisoning, whether of alimentary origin (as is generally the case) or of medicinal origin. To-day the physicians

* Sacharjin, *Berlin. Klin. Wochenschrift*, 1891, No. 25, p. 604.

of the School of St. Louis Hospital go so far in the treatment of urticaria which is very intense, whatever may be its source, as to prescribe an exclusive milk diet.

Such are the considerations which I wished to present relative to the subject of the biliary liver. The hepatic affections are many, and you will, I hope, find in the facts which I have stated practical indications for their treatment. In my next lecture I shall take up the glycogenic liver.

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*THE RESULTS OF THE SHURLY-GIBBES TREATMENT OF TUBERCULOSIS AT ASHEVILLE, N. C.**

By H. Longstreet Taylor, A.M., M D.

LAST spring I began the use of hypodermic injections of iodine and chloride of gold and sodium, with the inhalations of chlorine gas, in the treatment of laryngeal and pulmonary tuberculosis, and while in a few months' time it is impossible to form a decided opinion as to the ultimate results of the treatment, yet the first results are apparent and should be reported to the profession. Permanent results can only be claimed when years have elapsed without any active symptoms showing themselves. Relapses in tuberculosis are like recurrences in cancer, each one makes the case more and more hopeless, just as the absence of either is good cause to hope that the case is cured, which hope becomes stronger, until after the lapse of at least three years the case can be looked upon as cured. As the percentage of cures after operations for cancer is low, so is it in consumption, when the three years' limit is applied; and the earlier either disease is attacked scientifically the greater the probability of a fortunate outcome. The profession is for some reason unaccountably backward about insisting upon the necessity of this in both cancer and tuberculosis. The advice is given to come back if that lump in your breast gives you any trouble, thus robbing that woman of her only chance for life; and the diagnosis of tuberculosis is only too often withheld, until the suspicions of the sufferer wring it from his physician, or send him to another who may be more candid. This is a fatal error, for the intelligent co-operation of the patient is necessary in the earliest stages of consumption, and to call it bronchitis or catarrh is as much a mistake as to pay no attention to a lump in a woman's breast. It is only in the beginning that scientific treatment can avail in either case, and every one should be given the advantage of it. As long as cancer is local, the surgeon attacks it with hope and confidence; as long as infiltration is confined to a small area in one lung, proper management can do much for the consumptive. No plan of treatment ever has or ever can be instituted that will cause extensive infiltration to disappear, or that can make a well man out of a tubercular subject far advanced in the third stage of the disease, nor can any operative interference be of benefit to a cancer case with glands involved that it is impossible to remove. The positive diagnosis of phthisis should always be made early, and no cases be allowed to drift along until they get beyond the aid of any and every means of rescue. Then the percentage of cures would be much larger, and the lot of those members of the profession who battle with this dread monster would be more enviable than is now the case.

After this lengthy preface, the results given in this paper can be better appreciated. I claim no cures, for I have used the method less than a year.

I have followed the directions of Shurly and Gibbes quite closely, except in giving the inhalations of chlorine gas. In a hospital the gas can be evolved from chlorinated lime in a small chamber, but in private practice, with the majority of patients in hotels and boarding houses, such conveniences cannot be had. For the same reason the inhalations have been given but once a day, and then the chlorine gas was set free from the aqua chlori (United States Pharmacopœia), mixed liberally with a solution of chloride of sodium, and sprayed with considerable force (forty to seventy-five pounds' pressure in the receiver) into a small, closed air-chamber. A large bottle serves very well for the air-chamber. A hole is bored in the side, and an inhaler attached to the neck of the bottle. It is then suspended from the ceiling, so that the patient, seated in a chair, can apply his mouth to the inhaler, and the atomizer is used through the hole in the side. I saw this arrangement in Professor E. Fletcher Ingals's office in Chicago.

Originally I procured my solutions of iodine and gold from Professor J. E. Clark, Detroit College of Medicine. I have had no abscesses, and beyond the smart at the time of the injection and for half an hour afterwards, no

* Read before the Buncombe County Medical Society, November 2, 1891.

unpleasant symptoms. The indurations remaining after the injections of corrosive sublimate in syphilis are much larger, more painful and permanent, than those following iodine and gold injections.

I have not found that patients lose weight while taking this treatment, when at the same time every possible means is used to keep their nutrition at the highest point. One of the first results is to increase the amount of expectoration. It becomes more fluid, and the quantity gradually lessens, until finally râles have disappeared and small cavities have become dry.

Patients almost invariably sleep longer and more soundly when under the influence of the gold and iodine. Stubborn night-sweats, which have resisted the usual remedies, either cease without special treatment or become more amenable to it. I have not found it necessary to suspend the treatment if diarrhœa comes on. The diarrhœa is treated in the usual manner, with arsenite of copper, bismuth, etc., and the injections continued.

The injections are given for the first fortnight daily, beginning with the minimum dose, $\frac{1}{12}$ grain of iodine and $\frac{1}{30}$ grain of gold. The different solutions are used on alternate days, or, as recommended by Shurly, the iodine daily for a week and the gold daily for a week. During this time the dose is gradually increased, until the patient is given $\frac{1}{3}$ to $\frac{1}{2}$ grain of iodine and $\frac{1}{6}$ to $\frac{1}{4}$ grain of gold. I have given larger doses, but have then always found the patient saturated with iodine, tasting it in his expectoration, depressed and languid. The small dose, frequently repeated, with this, as with so many therapeutic agents, is more powerful against the disease and less hurtful to the patient. After giving a grain of iodine in one injection, I was called to see the patient in a few hours, and found the ary-epiglottic folds greatly swollen and œdematous. There were ulcerations in the larynx before, and the large dose of iodine seems to have irritated the tubercular deposit in some way. Under smaller doses this complication did not occur again, nor has it in any other case. No changes have ever been observed in the infiltrated portions of the lungs after the injections.

Just how these remedies act is an unanswered question. Chlorine, iodine, and the gold salts have all very great germicidal properties. Whether they act upon the bacilli or upon the toxalbuminoses produced by the disease it is difficult to say. I am convinced that in some way they exert a marked influence upon the course of the disease, as shown by the effect on the fever, the night-sweats, and the bronchial secretion, and by the increase in weight and improved sleep.

The inhalations of chlorine gas are always more or less irritating, and cause some coughing. They are well borne, except in ulcerative tubercular laryngitis. In the latter condition I substitute a spray of menthol and creasote. The ulcerations are also treated locally with menthol, creasote, lactic acid, etc.

Short accounts of a few cases will be added; the notes are taken from my case-book.

The first case is the first one I used the treatment on.

Case I.—Mr. B. J., 28 years of age; native of Ohio; family history of tuberculosis; came in December, 1890; had tuberculosis, following pneumonia and pleurisy; the lower lobe of the right lung was consolidated; jerky respiration and moist râles anteriorly above the consolidated portion; apex free, and respiratory murmur normal to third rib; left lung not affected; small tubercular ulcer situated in the inter-arytenoid space; tubercular bacilli found in sputum; expectoration very free; night-sweats; temperature went up to 101° or 103° F. every day; weight, one hundred and thirty pounds; had weighed one hundred and sixty-five pounds.

Under general tonic treatment, hypodermic injections of creasote and local treatment of larynx, he improved greatly. Temperature seldom reached 101° F., night-sweats ceased, and he weighed one hundred and forty-five pounds. In March he over-exerted himself, and had a relapse. Fever and night-sweats returned; right apex became involved. He lost weight and strength, until he was unable to leave his bed. At this period in his history he was put on the Shurly-Gibbes treatment without the inhalations of chlorine gas. He took fifteen injections. The dose was always small. He slept better and his night-sweats disappeared, and his fever was not so high. He became saturated with iodine, tasted it in his expectoration, and refused to take any more. He was taken home, and died there in a few months.

Case II.—Mr. B. R., aged 30 years; family history good; native of New York; first seen in February, 1891; tuberculosis of lungs and larynx dates from attack of la grippe six months previously; ulceration of right vocal

cord and interarytenoid space; larynx swollen and paretic; aphonic; apex of right lung consolidated to third rib; fine râles to centre of chest in front and mucous râles behind from spine of scapula to base of lung; prolonged expiration in left apex; evening temperature, 101° to 102° F.; night-sweats. Treated generally with tonics, baths, etc., and the larynx locally with lactic acid, menthol, and creosote. He improved in weight and his fever did not come on daily, but at irregular intervals; consolidation began in apex of left lung.

Early in April the injections of gold and iodine were begun and continued daily for six weeks. He slept better from the start, and the last month had no fever nor night-sweats. He gained in weight. The râles had disappeared from right lung, and no further infiltration took place. The ulcerations in the larynx healed entirely, but the voice, while stronger, was hoarse. He returned to his home, and I received a report of his continued improvement in August.

CASE III.—Miss K. J., aged 30 years; native of Missouri; maternal aunt had consumption. The disease had lasted two years when she came in February, 1891, weighing ninety-seven pounds; average weight, one hundred and ten pounds; had weighed one hundred and twenty pounds; tuberculosis of lungs. On right side a cavity was forming below clavicle in the infiltrated portion. Mucous râles over the entire right lung, except in consolidated apex, which extended to fourth rib in front and to spine of scapula behind; left side roughened inspiration, and prolonged, audible expiration in apex; a few moist and sibilant râles in lower lobe behind; temperature, 102° to 104° F. every afternoon and night; profuse, weakening night-sweats; expectoration very free and quantity large; tubercular bacilli were found in great numbers in her sputum.

She was treated constitutionally in the usual manner until early in May, with but little change, when she was put on the Shurly-Gibbes treatment with inhalations of chlorine gas. This was continued for two months, in which time she received over forty injections and as many inhalations. Her fever gradually left her, and on examination, June 9, showed a small dry cavity below clavicle, right side; no râles anywhere; expectoration reduced to a small quantity on arising in the morning, night-sweats rarely occurring, and weight one hundred and one pounds. An attack of diarrhœa came on early in July, during which she lost several pounds. This was soon controlled, and she has steadily gained in strength since.

October 31.—An examination showed that the disease was quiescent; no fevers, no night-sweats, no cough, except early in the morning, which is probably due to pharyngeal mucus; weight, one hundred and six pounds; has taken no medicine for past three months. This was an advanced case. She did not improve until put on gold and iodine and chlorine inhalations, which looks as though the treatment had helped her. She is confident of it herself.

CASE IV.—Mr. K. W., aged 25 years; native of New York; family history good; no fever, no night-sweats; expectoration small in quantity, but contained tubercle bacilli; hacking cough almost constant; voice hoarse; physical signs of a slight catarrh in both apices; vocal cords reddened but not ulcerated; weight, one hundred and seventeen pounds; average weight, one hundred and twenty pounds; treatment began in April.

General tonic treatment for one month; no gain in weight or change in condition; larynx somewhat improved under topical applications.

Was then treated one month on the Shurly-Gibbes method without inhalations of chlorine gas. At the end of that time he weighed one hundred and twenty-six pounds, which was more than he had ever weighed; had good appetite and digestion. There were no râles in either apex, but prolonged expiration remained. In the very sparse expectoration no tubercle bacilli could be found. His voice was stronger, and larynx presented normal appearance,

In order not to make this paper too long, no more histories will be given, but a simple synopsis of results, from which no case is excluded that has had as many as fifteen injections.

Total number of cases, twenty-two.

Advanced cases, with no improvement in their condition, to which category Case I. belongs, six, or twenty-seven per cent. of the whole number.

Advanced cases, with improvement, to which category Case II. belongs, eight, or thirty-six per cent. of the number treated.

Cases which have shown very great improvement, including advanced and incipient cases, to which category Cases III. and IV. belong, eight, or thirty-six per cent. of the total.

It is impossible to compare these results with those obtained without the injections,

in those cases in which reliance was placed entirely upon climatic and tonic treatment, with attention to symptoms as they arose, for two reasons.

The first is, that many cases come here so far advanced that euthanasia is the one object of all treatment. They cannot oftentimes even reach their homes alive. Such cases would throw the balance at once to the side of the Shurly-Gibbes treatment, and evidently unjustly.

The second reason is, that, in parallel cases the comparison could only be made with those who have refused the Shurly-Gibbes remedies,—patients who have not had the courage to undergo the treatment. The temperament of such cases is against them in their battle for health.

That the climatic conditions at Asheville are especially well suited to tubercular patients is very generally acknowledged, and I can report several cases that were here last year that have gone on since without relapse or any return of the symptoms of their disease.

The climatic, combined with the Shurly-Gibbes treatment, is the one I now urge on all cases, and I do so from the conviction that the latter is a decided aid to the former, and that a larger percentage of improved, and possibly cured, cases results from the combination than from climatic treatment with careful supervision alone.

No aid should be omitted that offers the least hope, and if cases are sent away from home early in the history of their disease, and with the best climatic surroundings are given the advantage of scientific care and direction, the prognosis is not as hopeless as it would have been considered only a decade ago.

DRUGS,—WHAT ARE THEY GOOD FOR?

By W. H. Washburn, M.D., Milwaukee, Wis.

DURING that long and remote period of time in which man, clothed in the raiment with which nature provided him, wandered alone on the face of the earth, not yet having invented articulate speech, he had no more knowledge of remedial agents and resources than is possessed by the chimpanzee.

When, in obedience to the law of evolution, language developed, society became organized, and the forces of nature were to a certain extent subdued to the uses of man, wealth began to accumulate, and *all* his time was not required to secure the absolute necessities of life, then there was leisure for meditation, speculation, and investigation.

Civilization having first appeared in tropical or semi-tropical latitudes, where the aspects of nature are, comparatively speaking, terrible, the imaginative faculties of the mind were early brought into exercise. Events occurring suddenly, without apparent cause, such as earthquakes, volcanic eruptions, inundations, epidemics of fatal disease, were attributed to the wrath of an outraged deity. Disease thus being thought to be of supernatural origin, it followed naturally that the first remedy that suggested itself to the mind of man was some sacrifice to appease the anger of the offended god. And, if a sacrifice were to be offered, the individuals who would be expected to officiate with the greatest prospect of success would be the priests devoted to the service of the gods. It thus happened that the sacerdotal class very generally, and over a wide extent of the earth's surface in both hemispheres, were the first to practise the healing art.

Magic and incantation were the earliest means resorted to to effect a cure. When, however, in the course of revolving ages, it was found by accident or experience that certain roots and herbs possessed remedial virtues, these were added to the armamentarium of the magician. But, owing to the unshaken confidence of the masses of the people in the efficacy of magic, there resulted a very interesting combination of the practical and magical in their methods. The practical recipe might contain any variety of roots and herbs, applied in ointment or drunk in decoction, but with this the magical formula was also required to deal with the demon cause of the disease.

That the magi—a name given by the Greeks to an hereditary line of ancient Persian priests—exercised a considerable influence upon the subsequent civilization of the Western world is attested by the fact that they gave their name to sorcery, enchantment, necromancy, and the so-called occult sciences in general. The word magic is still used with the same signification as it was in ancient times,—that is, to indicate "a confused mass of beliefs and practices, hardly agreeing in anything except in being beyond those ordinary actions of cause and effect which men have come to regard as merely natural." Belief in magic is regarded as among the earliest evidences of the growth of human thought. That this is true is shown by the fact that it appears in the

records of the most remote antiquity, and exists in a marked degree among those members of the human family, now existing, who are lowest in the scale of civilization, as, for example, some of the native tribes of Australia, whose whole existence is oppressed by the terrors of sorcery. Every published work on the present condition, customs, habits, and beliefs of savage tribes indicates the powerful influence enjoyed by the native magician, who not infrequently represents in his single person sorcerer, priest, medicine-man, and even chief of his tribe.

Among the cultured and civilized nations of the ancient world magic held a prominent place. Their literatures are largely responsible for forming magic into more or less elaborate ritualistic systems. The literary remains of ancient Egypt, Babylon, and Assyria illustrate this, Egypt and Babylon especially being the chief source from whence the later world learned what has been referred to as the higher branches of occult science. Later, through the literatures of Greece and Rome, magical rites, mysteries, and ceremonies were introduced into the Western world. Greek mythological literature is alive with the magic; the consultation of oracle gods at various temples, of which that of Apollo at Delphi was the favorite; the turning of the companions of Odysseus into swine by Circe; the twelve labors of Hercules; the story of Orpheus and Eurydice, etc.

The rise of Greek philosophy several centuries before Christ threatened the overthrow of magic and magical systems, but Greek philosophy being the outgrowth of *deductive* methods of reasoning, soon evolved numerous *schools*,—the Ionian, Eleatic, Cynic, Pythagorean, Epicurean, Sophistic. The speculations of the exponents of these different schools soon became more or less mystical, and there was theorizing on the significance of numbers, harmonical relations, the harmony of the spheres, transmigration of souls, the interpretation of dreams, the nature of the world and the soul, etc. And hence Greek philosophy only served, perhaps, to change somewhat magical speculations.

Among the early Christians sorcery was recognized as illegal magic and as such was condemned, when Constantine made Christianity the legal religion of the Roman empire, Thor and Odin were declared to be demons and the rites of their devotees proscribed. During the middle ages magic was represented in Europe by mysticism and scholasticism, a species of theological philosophizing, and by witchcraft, only dismissed from belief in modern times.

During all this long period medical philosophy was largely a mass of absurdity. Hippocrates, the father of medical philosophy, was contemporary with Antisthenes, Aristophanes, Democritus, Diogenes, Isocrates, Plato, Protagoras, Socrates, all of whom were deductive reasoners, and his medical speculations were deductive. As Greek philosophy soon broke up into numerous schools, in consequence of the imperfections of the deductive method, so medical philosophy, and from the same cause, developed many schools,—the empirics, the dogmatists, the methodists, the eclectics, the humoral pathologists, the solidists, the animists, the iatro-physicals, the iatro-chemicals, the Brunonians, the sceptics, the homœopathists. These schools attempted to evolve from the inner consciousness a knowledge of the nature of disease and the means of cure, and, reflecting the influences of the times, were more or less fanciful, mysterious, magical. Disease was an entity existing in the blood, and hence phlebotomy, the body being composed of all the parts of visible nature, the "sun, moon, stars, and the poles of heaven," and subject to the same chemical laws, disease was to be treated by chemicals. Disease was a "spiritual dynamic derangement of our spiritual vital principle," and to be treated by drugs spiritualized by attenuation, and acting by virtue of "some occult, self-existing force," etc.

In our times, and among the educated, nothing is now heard of belief in necromancy and magic, and the THING itself alone remains. Communications in "spirit circles," spirit-writing, the fear of spilling salt, the stranger in the tea-cup, the shroud in the candle, the divine intervention in the production of disease, floods, and other calamities as a punishment for blasphemy, Sabbath-breaking, or other wrong-doing, the cure of inflammation by a "thunder-bolt," a potato in the pocket for the cure of rheumatism, the galvanic belt, the faith-cure, blue-glass, Christian science, etc.

It will thus be seen that the human mind for the past five thousand years has been *drilled* into a belief, in one way or another, in the mysterious, the supernatural, the magical. The influence of all the traditions and literatures of the past has oppressed us, and given us a mental character predisposed to grasp at the unknown, to believe in the unseen. An exaggerated respect for the past

has retarded the progress of civilization on every hand, and in no line of thought more than in medical philosophy.

The brief historical view here given shows, I think, the genesis of the feeling entertained by the majority of mankind, and even of educated mankind, that there may still be an effect without an adequate and natural cause, and that disease is in some way *mysteriously cured* by drugs. And I am persuaded that there are many, even in the ranks of the medical profession, who have not yet succeeded in overcoming a mental predisposition which has been handed down to them by an ancestry more than five thousand years old. We see this illustrated in the doctor who prescribes the new drugs as soon as they are foisted upon the market. Being new and unknown, there is something fascinating about them, and they are prescribed in the hope that in some occult, mysterious, magical way a cure may result. I imagine that this brotherhood must be numerous in the profession from the great number of travelling men who call upon me with samples of new remedies or new compounds of "wonderful power."

Dr. John W. Draper has well said, "In the confidence of youth he (man) imagines that very much is under his control; in the disappointment of old age, very little. As time wears on, and the delusions of early imagination vanish away, he learns to correct his sanguine views, and prescribes a narrower boundary for the things he expects to obtain. The realities of life undeceive him at last, and there steals over the evening of his days an unwelcome conviction of the vanity of human hopes." Of no class is this more true than of medical men. As the graduate goes forth from the portals of his *alma mater*, feeling, as many do, that his education is finished, he believes that disease and death will retreat before his *attacks* and skulk ignominiously from the field; that he possesses in the materia medica weapons from whose use he will witness "marvellous results." But as time wears on the "realities of life undeceive him at last," and he is apt to fall into a routine and hap-hazard way of prescribing drugs without any expectation of achieving results. Having himself risen above the mental horizon of the laity, he despises their belief in the efficacy of drugs, as the magician of old despised those whom he duped. He believes that nature alone and unaided effects a cure, and that drugs are useless; but the practice of medicine being a "business," as well as an art, he continues the methods of his prototype, the magician. He knows that his patient believes disease is an entity to be driven from the body in some mysterious way by the agency of drugs, and hence, while he gives practical directions as to diet and regimen, he at the same time prescribes some drug to please the fancy of the patient; or, in other words, incant—that is, enchant—the demon cause of the disease. He has studied the experiments of Louis and his colaborers on the natural history of disease, and, imbued with the belief that nature is competent to effect a cure in any case where cure is possible, thinks that "it would be better for mankind if all the medicines were poured into the sea, but it would be hard on the fishes," and that "physicians have hurried thousands to their graves who would have recovered if left to nature." He hence becomes a medical nihilist. His conclusions are largely due to the fact that he prescribes drugs as a matter of form or "business," and does not expect, and, in fact, does not observe, results, and he thus gradually brings himself to believe that they are of no use whatever.

The craze of the day being external medicine,—surgery,—he is apt to go into that field enthusiastically, and often more or less blindly. Entertaining, as he does, the most profound admiration for the achievements of modern surgery, he regards, with a feeling akin to pity, the mere physician, and concludes that the only real service rendered to mankind by the profession is by means of surgical procedures.

It seems to me that he who arrives at this conclusion has not succeeded in elevating his mental vision much, if any, above that of the "common herd," and has fallen far short of that intellectual altitude from which he can take a general view.

He has forgotten the discovery of Schönlein, in 1839, that the contagious disease of the scalp, known as favus, is caused by a microscopic parasite, the *Achorion Schönleinii*, which discovery has led to positive and curative treatment by means of drugs of a long line of skin-diseases. He has forgotten the specific effects of mercury in syphilis, quinine in malaria, iron in chlorosis, atropine in certain affections of the eye and in opium-poisoning, and digitalis upon cardiac action.

A great step in advance will be taken when physicians pay more attention to the study of the physiological effects of drugs, and learn to recognize the fact that "the advance of medical science consists not so much in the discovery of new drugs as in a better understanding of how to use old ones."

I shall only take time to call attention to a few individual drugs as illustrations of what can be done in the way of alleviating pain and in the postponement of death by their use. But, before entering upon this part of the subject, I want to emphasize the fact that in very few, if any, cases does the physician *cure* disease. The office of the physician may be compared with that of the pilot of a boat in its descent through the rapids of the St. Lawrence. The business of the pilot is to guide the boat safely past the rocks and shoals. He does not propel the boat, neither can he arrest its onward flight. So with the physician. He cannot "break up" the disease, nor can he effect a cure. The power which heals the sick is the *vis medicatrix naturæ*, and the physician is the pilot who attempts to so manage the individual case as to avoid the rocks and shoals, or, in other words, he aids nature by removing obstacles from her way, or by supplying materials with which she can work. This is all that can be accomplished in the present state of our knowledge, either by the use of drugs or surgical procedures. If, then, this fact is kept well in mind, we shall "prescribe a narrower boundary for the things we expect to attain," and we shall suffer fewer disappointments, and more often attain the things we expect and hope for, while we shall less frequently fall into sins of commission.

In the practice of medicine, pain is one of the most frequent conditions we are called upon to relieve. Opium, therefore, by virtue of its analgesic properties, the Hercules of the materia medica,—a drug without which the practice of medicine would be a delusion and a snare,—demands the first word. This drug exerts a primary action upon the brain and spinal cord, by which nervous sensibility, both motor and sensory, is diminished, and hence relaxation of contractile tissues and lessened sensibility to external impressions. These effects of the drug are well illustrated in renal and bilious colic, in which affections its action upon contractile tissues results in relaxation of the muscular walls of the ducts, and its action upon sensory nerve-fibres ameliorates pain. In renal asthma—a condition caused by constriction of the pulmonary arterioles—the same merciful effects of the drug are witnessed. In inflammatory processes, accompanied by pain, as a result of increased textural change in the nerve itself, opium not only relieves pain, but, by lessening the amount of textural change in the nerves, produces a curative effect,—that is, it assists the human organism to initiate that internal reaction to external action, by which nature effects a cure, while at the same time it renders the patient's suffering less acute, and the majority of mankind will agree with the late Professor Allen, of Chicago, in saying, "As for me, give me freedom (from pain) or give me death." In such cases, in so far as the opiate controls pain, in just so far does it control textural change, and thus aid nature in effecting a cure.

In physostigmine we have a motor depressant which acts powerfully upon the respiratory and circulatory centres, and also upon the spinal motor centres, thus rendering it a valuable agent in certain forms of maniacal excitement occurring in patients suffering from general paralysis. It is believed that, by virtue of this action, the drug retards the progress of the disease, and, in some instances, has arrested it for a time entirely. Its constitutional effects are antagonistic to those of strychnine, and hence its value in strychnine-poisoning. Its active principle, eserine, is, I believe, extensively used by oculists to produce its specific effects upon the eye,—namely, contracting the pupil and lessening intraocular tension. Another drug used successfully by oculists is cocaine, which not only renders great service as a local anæsthetic, but also, by its action in contracting the arterioles, produces curative effects upon inflammatory processes.

Aconite is a drug which lowers the action of the heart and respiration and dilates the cutaneous vessels, thus increasing thermolysis and relieving local congestions. I believe I have seen cases of quinsy absorbed by the early use of the drug, which is specially useful in acute catarrhs of the upper air-passages.

The beneficial effects of alcohol as a general stimulant in adynamic conditions, such as we often see in typhoid fever and pneumonia, need only be mentioned. By its use the vitality of the patient is so reinforced as to bridge over the critical period.

Nux vomica is another drug whose uses are such as to entitle it to a place in this paper. Experiments have established its right to be classed as a cardiac and respiratory stimulant, and, since the publication of Fothergill's "Antagonism of Therapeutic Agents," it has been widely used to secure these ends. By virtue of these properties, it antagonizes the toxic effects of aconite and chloral. Its effects are often striking in the dyspnœa of broncho-pneumonia, and also in the distressing dyspnœa of bronchitis occur-

ring in patients suffering from chronic pulmonary congestion, the result of heart-disease. Nux vomica, by its stimulant action upon the sympathetic nervous system, aids digestion, and increases the activity of the various glandular organs of the body, and, probably, by thus hastening the elimination of ptomaïnes, relieves "sick headaches" depending upon torpidity of the digestive and excretory organs. As to its value in such headaches there is much evidence, and, I am happy to say, that I am able to bear personal testimony to the fact that for six years it has acted with unvarying success. I have found strychnine of value as a heart stimulant in the later stages of chronic interstitial nephritis where cardiac failure is present, Since the publication of Fothergill's experiments, which demonstrated the fact that strychnine is a cardiac stimulant, it has been used to a considerable extent in the later stages of typhoid fever and pneumonia, when such an agent is indicated, and recent reports of cases in the journals have corroborated the conclusions reached by Fothergill.

It has been my practice through life to look with suspicion upon the new drugs which chemistry and pharmacy, especially of late, are rapidly introducing to us. When it is remembered that the few drugs we now possess, which occupy a settled, or nearly settled, position in therapeutics, have been known and in use, in some cases, for centuries, it will be seen that a few months or years are not enough to establish the reputation of a new agent so firmly as to justify the practitioner in submitting his patients to their experimental use. But as the new antipyretic group has now been before the profession for some years, I shall be excused if I advert to it. In speaking of this group, I shall refer to phenacetin as typical of its virtues.

While it may not, and, so far as I know, does not, exert any curative influence over pathological processes, it certainly often adds very much to the comfort of the patient while nature is effecting a cure. By its stimulation of the inhibitory centres of the brain, it is capable of relieving many aches and pains, as was conspicuously shown during our recent epidemic of influenza, not to mention its well-known effects in certain painful neuroses.

While I am not very much given to the use of antipyretics in cases of fever, I believe there are occasions when their use is not only proper but urgently demanded. In rheumatic fever we have a disease in which there is the greatest activity in nitrogenous waste, and hence the amount of heat production is greater than in any other febrile disease. It does not necessarily follow, however, that the body temperature is excessive, for the thermolytic action of the cutaneous surface is stimulated to the highest degree, profuse perspiration occurring, as it rarely, if ever, does in any other disease, and there is, consequently, excessive heat loss. But when any function is carried to its highest activity, it is on the verge of failure, and so here the thermolytic action of the skin may suddenly cease, and then there supervenes that condition known as hyperpyrexia. In such an event as this, a drug, like phenacetin, which reduces body temperature by diminishing nitrogenous catabolism, and hence thermogenesis, may be expected to serve a useful purpose, and I believe will often save life. I am certain that I have seen immediate death averted, in at least two instances, by a rapid reduction of body temperature by means of this drug.

It would be easy to indefinitely prolong this list of illustrations, but sufficient has already been said to point the moral which it is the purpose of this paper to inculcate,—namely, let the scientific physician prescribe *drugs* only when he has some good reason therefor, and then prescribe with a direct view to obtaining physiological effects. Do not prescribe a new drug because some one else has used it in a certain case, and the patient survived. Remember that in comparatively few cases are the efforts of the physician directed to curative treatment. He must recognize the fact that disease is not an entity in the body to be driven out in some mysterious way by the agency of drugs, but that it is "a perversion of the material structure of the body or some of its parts," the result of "some unusual external action, to which there has been no answering internal action;" that his office is not specially to *combat disease*, but to so conserve the vitality of his patient that nature may have an opportunity to initiate the necessary "answering internal action" by which health is restored; that in the discharge of his duties as physician, he is simply the gentlemanly "hod-carrier of nature," supplying, it may be, materials with which she can work or removing obstacles from her way.

N.B.—Some portions of this paper are taken from an essay by the present writer, which appeared in the *Medical and Surgical Reporter*, July 11, 1891.

803 Grand Avenue.

*A CASE OF OVERDOSE OF CANNABIS INDICA.**

By W. D. Hamaker, M.D., Meadville, Pa.

I WAS called suddenly one evening in July to see Dr. D., a recent graduate in medicine, who had taken at 5.20 P.M., by way of testing the quality of the medicine, 41 drops of Squibb's fluid extract of cannabis indica, dropped from the bottle with the cork. I saw him at 7.15 P.M., and with his permission I will give a brief account of his symptoms, based on notes taken at the time.

7.15 P.M.—When I entered his house I found him walking the floor excitedly, laughing and talking continuously, but not incoherently. At times he would cry, and then suddenly change to laughing. He explained to me at once what had happened, and said there was no use sending for me, as the symptoms would wear off in an hour or two, and that he would have to bear it till the effects wore off. He kept on walking rapidly, and talking in a tone of voice pitched higher than his usual tone, and could not sit or lie down for a minute. If we would induce him to lie down, he would get up immediately and begin his rapid walk.

7.30 P.M.—Pulse, 120; respiration, standing, 48; temperature, normal. He scolded occasionally when there was nothing scarcely to warrant it, and was easily irritated by anything his younger brother said or did. Time seemed very, very long. This was his constant complaint. He said he felt as if he were "rattling around among the centuries." When I put the thermometer under his tongue he took it out in a few seconds, because it took so long a time he could not keep it there. He then resumed his walk.

7.40 P.M.—Talking foolishly, and reproaching himself for being rash. He complained of a "leathery" feeling in the calves of his legs and "a strange feeling in the bowels."

7.41 P.M.—Said the feeling was extending up the legs, but could not describe it. Sensation seemed natural if I touched the leg. He had no idea of time. A minute seemed like hours, but he could reason out that he was at fault by the aid of the two facts,—that he had taken the hemp at 5.20 P.M., and that it was still daylight and that the lights had not yet been lit. When he tried to think "everything goes," "everything gets slippery when I try to get hold of anything." Foolish remarks at times.

7.45 P.M.—Sat down, and kept more quiet for a while; stood at the window for a few minutes; sat down again; reproached himself for giving trouble.

7.48 P.M.—Laid down; kept feet moving for some time; jerking of the tendons was marked all along. There was difficulty in catching the words he wanted when he tried to say anything, and in attempting to get the word needed he would often lose the whole idea he had started out to express. About this time he gave me a lecture on Dr. Hart's "den of bones," attempting to bring in the word osteo-syndesmological frequently, but stumbling on the pronunciation every time he attempted it. In a few minutes more he lay very quiet, and thought he would probably sleep. I left him, and returned about 9 P.M., when I found that he was quite well, but somewhat languid and drowsy. Afterwards, in conversation, he gave me the following additional impression: Just after the first symptoms came on him, he recollected what he had taken, and a feeling of dread of danger came over him. This lasted a very short time, and never returned. He dreaded a possible symptom that he had read in H. C. Wood's experience,—that of falling. The peculiarity about his mental operations was that while thinking on one subject other thoughts would dart in to interfere with the first, and in talking his sentences and expressions would be of a mixed character, as derived from different lines of thought or subjects. I omitted to state that there was redness of the eyes and profuse lachrymation, even after other symptoms had disappeared. Pulse remained rather quick while under my observation, but I was not able to count it very often on account of his restlessness. Respirations did not remain as rapid as at first. No treatment of any kind was used.

883 Water Street.

* Read before the Crawford County Medical Society, August 5, 1891.

*LA GRIPPE.**

By Walter P. Ellis, M.D., Livermore, Ky.

I PROPOSE to devote what I shall have to say to-day to the consideration of a disease which, until quite a recent date, was practically unknown to the profession in this country, at least in its present form, and yet, at some time during the last two years, it has been epidemic in almost every civilized coun-

* Read before the McLean County, Ky., Medical Society, at its regular meeting, August 1, 1891.

try of the globe. I refer to what is now almost universally known among the laity as *la grippe*.

This name was given to the disease by the French because of its rapid onset and the suddenness with which it assumed epidemic proportions. For the same reasons, and because no time was allowed scientists to assign to it its proper nosological position, each country or people had its own peculiar name.

Next to *la grippe* the most common appellation is the "Russian influenza," from the fact that it had its origin in the Russian capital. A noted English physician has called it a "bastard pulmonary rheumatism," which, perhaps, comes about as near its true character as any name that has been suggested. The multiplicity of names indicates that the nature of this disorder is by no means perfectly understood, and until it is we know of no better name than "*la grippe*," because it implies kinship with no other malady, and commits us to no theory as to its nature or origin. As to the etiology of la grippe there is little doubt of its microbic nature, although the specific micro-organism has not yet been isolated and its causal relation to the disease demonstrated. Many bacteriologists have investigated the subject, and more than once it has been announced that the labors of some one had been crowned with success, but up to the present time it must be admitted that the agile microbe—bacillus, coccus, or whatever it may be—has eluded the highest magnifying power of the microscopist.

Dr. H. B. Baker, of the Michigan State Board of Health, has devoted considerable time to the discovery of the cause of influenza. He says the germs of the disease are always present, but that certain meteorological conditions are necessary to irritate the air-passages sufficiently to enable the germs to gain an entrance into the body; these conditions being an excessive amount of ozone in the atmosphere and an unusual prevalence of north and northeast winds.

La grippe is certainly no respecter of persons, for while the weak and delicate, and those at the extremes of life, suffer more seriously from its ravages, the strong and robust are not exempt; all ages and conditions are alike attacked by it.

Whether or not it is contagious has never been definitely settled, many contending that it is not, depending altogether upon atmospheric or telluric conditions for its propagation and continuance; while others claim that it is at least feebly so, and cite many facts which can be explained on no other hypothesis. My own experience leads me to believe that, if contagious at all, it is so to such a slight degree as to be practically ignored.

During the noted epidemic of 1889–90 I was almost continually exposed to the influence of the disease, and yet neither I nor any of my family were attacked by it, my house and one other being the only ones in the town of six hundred or seven hundred inhabitants that were exempt from the malady. This, too, without any especial effort at prophylaxis. On the other hand, a case is reported of a traveller who had the disease while in London, and, immediately upon his convalescence, went to Paris, where he was taken speedily worse and died. His remains were embalmed and sent to his home in this country, where the disease was not then prevalent. Upon its arrival, the coffin was opened, and the body viewed by friends and relatives. Although there was no other source of contagion, many of those who saw the body were soon after taken sick with la grippe, and altogether there were eighteen well-developed cases. This case, if it means anything at all more than a mere coincidence, is a rather strong argument in favor of contagion.

The general observation also has been that in the recent epidemics the course of the disease was not in accordance with that of prevailing winds, but rather along the great lines of travel, which seems in favor of the theory of its dependence, in some degree, at least, upon personal contact of individuals for its propagation.

The symptoms of the disease are many and varied, as would be supposed from the variety of names that have been bestowed upon it. In some cases its onset is sudden, and it may go as quickly as it came, while in others it is preceded by a period of malaise extending over several days, or even weeks, with a tendency to frequent relapses. Usually it is not slow in asserting itself after the victim has been exposed to its influence.

There is a short period of dulness and malaise, and then usually a chill, followed by fever of a more or less pronounced type, with pains in the joints and bones, and a general muscular soreness, as if the patient had just undergone the most violent exercise, or, as some express it, "as if they had been beaten all over with a club." This resemblance to dengue, or muscular rheumatism, was characteristic of nearly all the cases that came under my observation. The rise of temperature is persistent, but the chart is very

irregular, showing many sudden curves, yet differing from that of intermittent fever in the absence of regularity in the rise and fall. The temperature ranges from 100° to 103° F., very seldom going above the latter point in the absence of complications. The pulse in the beginning is full and strong in sthenic cases, but it soon loses these qualities, and, with the defervescence of the fever, becomes weak and thready.

There is generally an increase in the quantity of urates, while the amount of urine passed in twenty-four hours is less than normal, with sometimes a trace of albumen. This, however, is by no means constant, and must be regarded as an exceptional complication.

In the majority of cases the disease begins in the mucous membranes of the nasal and respiratory passages, resembling very much the premonitory symptoms of a "cold in the head," which, however, rapidly assumes more formidable proportions, accompanied by some sneezing and paroxysms of cough, which at this time is usually out of all proportion to the physical signs.

As the case progresses, bronchitis, bronchopneumonia, and pneumonia proper may develop, when the physical signs of those diseases show themselves. Upon the nervous system the disease has a peculiar depressing influence, characterized by sleeplessness, dizziness, or a tendency to fainting, with a condition of mental hebetude which indicates the profound impression made upon the nervous centres, and which lasts during the whole course of the disease, until convalescence is established. The complications which may arise during a case of la grippe are numerous, and many of them are of so serious a nature as to determine a fatal issue. Especially is this true of those diseases affecting the respiratory organs. It is a very general observation that bronchitis, pneumonia, etc., complicating or following influenza, are attended by a much greater rate of mortality than is usual under the ordinary conditions. The Vienna correspondent of the *British Medical Journal* states that during the epidemic of 1890 in that city aural complications were very common. Acute inflammation of the tympanum, with hemorrhage, and catarrh of the Eustachian tube and tympanic cavity were most commonly met with, but even bilateral *purulent otitis media* was not unusual. He also states that cutaneous complications of an acute character are prone to recur.

Various forms of herpes, erythema, eczema, and even measles are mentioned. I have myself frequently observed these cutaneous affections occurring as complications in cases of influenza, but the most common in my experience has been urticaria, with some cases of eczema of the face and scalp, and one case of facial erysipelas.

It has been noticed and commented upon by physicians and health officers that the general tone of vitality is markedly lowered during an epidemic of influenza, and many are thereby rendered much more susceptible to the development of the graver complications. Another significant fact, which, doubtless, has its cause in this lowered vitality, is that all the most dangerous diseases increase in severity and fatality during the prevalence of la grippe. In view of these facts, it becomes the duty of the profession everywhere to do all in its power to prevent the recurrence of epidemics by impressing the laity with the importance of hygienic and sanitary precautions.

The subject of the proper treatment of la grippe is one upon which much has been said and written, but it is not my purpose now to do more than briefly sketch the methods that have been most successful in my hands. In uncomplicated cases I have found that active treatment is not always necessary. Many times I have ordered a full dose of quinine and Dover's powder at bedtime, a gargle containing tr. iron and pot. chlorate, followed the next day with a few doses of antikamnia or phenacetin, if there were any fever or rheumatic pains, with the result of cutting short the disease and preventing an attack. But cases that are so easily managed are the exception, not the rule; but the fact that there are such should not be lost sight of.

Quinine is almost always indicated, on account of the intermittent type of the fever, and given in full doses—12 to 15 grains—in the morning, the evening exacerbations are usually not so pronounced, and the course of the disease is favorably modified thereby. Quinine is also indicated for its tonic effect, by the extreme nervous depression and prostration which is an almost invariable accompaniment of the disease, and given in small doses,—1 to 2 grains,—at proper intervals, it meets and fulfils this indication admirably. Especially when used in combination with other remedies, as in the following prescription, it accomplishes results not easily obtainable with any other drug or combination:

R Quiniæ sulph.,
Salol, āā gr. iii;
Phenacetin, gr. iv.
M. ft. pil. vel cap. No. 1.
Sig.—One or two every three hours.

The *Medical Age* is authority for the statement that Professor E. R. Palmer, of Louisville, considers this combination a specific, and, in my experience with it, it has never disappointed me. The professor recommends the salicylate of quinine instead of the sulphate in this prescription, but as that was not obtainable without some difficulty, the sulphate was used, with as good results as could reasonably have been hoped for. For the neuralgic or rheumatoid symptoms the best results are obtained from antikamnia, acetanilide, or phenacetin, especially if combined with salol.

Dr. C. L. Hogeboom, in the *Medical Record*, claims to have derived great benefit from the administration of full doses of oil of peppermint three times a day. He says that it acts with great promptness as a powerful stimulant to the vaso-motor nervous system, reduces the pulse-rate, relieves local congestion, and speedily dispels the most alarming symptoms. The oil is known to be a powerful germicide, and upon the theory of the germ origin of the disease, aside from its power as a diffusible stimulant, it is worthy of a trial.

When, as is often the case, the bronchial symptoms are severe from the start, an effort should be made to loosen the secretions by the administration of the wine of ipecac, in combination with ammonium chloride or spts. Mindererus.

My treatment of an uncomplicated case would be about as follows:

A mild cathartic, preferably a mercurial, would be given in the beginning of the case to remove any irritating substances, whether undigested particles of food, microbes, or ptomaïnes, from the digestive tract, and thus prevent their absorption to increase or complicate the existing troubles. This should be followed by a grain of opium, or ⅙ grain of morphine, to arrest cough, sneezing, or pain, and the mucoid secretion of the upper respiratory tract. This may be repeated as often as necessary, or, after the first dose, phenacetin or acetanilide may be combined with the morphine, if the nervous symptoms are pronounced and pain is severe. The pill of quinine, salol, and phenacetin is given every three or four hours, and the nares may be frequently flushed with some mild germicide solution, such as boric acid, listerine, campho-phenique, or whatever best suits the attendant's fancy.

In lieu of a hot bath, some diffusible stimulant should be given to prevent internal congestions and increase the peripheral circulation. Keep the patient in an equable temperature, free from draughts, and give good, wholesome, nourishing food, tonics, etc., with small quantities of an alcoholic stimulant if there is a tendency to asthenia. This, we believe, will be sufficient to insure a favorable termination in an uncomplicated case of la grippe.

FURTHER CONTRIBUTION TO THE THERAPEUTICS OF HAY-FEVER.

By Alexander Rixa, M.D., New York.

IN my previous contributions to the "Therapeutics of Hay-Fever," particularly in my last year's report (January number, 1891), I endeavored to show by what method I succeed in preventing the development of hay-fever, but also declared that I have been powerless to arrest the hay or reflex asthma, the most distressing complication of this painful disease. However, this year, I believe, I found a very efficient preparation, which controls the disease in a very surprising measure.

The remedy I have reference to is the *terpin hydrate*. It comes in the market in the form of colorless monoclinic crystals, which melt at 100° C., and has the composition $C_{10}H_{16} + 3H_2O$.

In my previous and my present investigations I attained the following results from its action: In small doses (from 2 to 5 grains) it liquefies and increases the secretion of the bronchial mucous membrane, and thus facilitates expectoration. In large quantities, however (in 15- to 20-grain doses), it reduces the secretion and renders expectoration less, until it stops it altogether. In cases of bronchial dyspnœa, in consequence of the plugging of the bronchi by too copious secretion, it is of the greatest value. In hay and bronchial asthma it acts like a charm,—*i.e.*, by giving it to those who are subject to the disease, it arrests the outbreak.

I administered it in capsules (5 grains each), in daily doses of from 45 to 60 grains, and more if required, without any disagreeable consequences. The best time for its administration seems to be during meal-time, about 15 grains being given at one dose, three times a day, and, if required, 15

grains at bedtime; and exceptionally, if asthma symptoms appear on damp, cloudy days, 15 grains more during the night. The results I obtained with this treatment were highly surprising and gratifying.

I treated ten cases of hay-fever this season, of which six have been subject to hay-asthma for a number of years. In but one case—a travelling salesman, who was attacked on the road, in a southern country—have I seen the hay-fever developed this year. However, as soon as the patient came under my observation, I put him under the following treatment: The nares were irrigated with nasal douche every three or four hours with one-third of peroxide of hydrogen and two-thirds of boiled water, cooled. The second day already the aggravating inflammatory symptoms disappeared, and then a spray of peroxide of hydrogen, with glycerin, c. p., half and half, in atomizer, was used during the whole period.

All the other cases were treated in the same manner as given in my last year's report, with the same satisfactory result.

In those of my patients subject to hay-asthma I also attained the most astonishing results with the terpin hydrate treatment. Four out of six cases did not have the slightest attack of hay-asthma during the whole season, and the other two had but two or three light attacks, which, however, were caused by carelessness and neglect in carrying out my orders. One patient went out during a cool evening and caught cold, while the other neglected to take the advised medicine as ordered, on account of his feeling well, believing that it was unnecessary.

In the first case a plugging of the bronchi took place, which caused a severe attack of bronchial dyspnœa. There, again, the *Javanese ipecacuanha*, a new preparation, acted promptly and like a charm. Half a teaspoonful of the preparation was given in some warm water, and in less than ten minutes copious expectoration and vomiting took place, relieving the patient instantly.

In all the cases where the remedy did not act promptly for a while, it was always due to neglect and carelessness.

In the last period of the disease—in the catarrhal stage—the *anodyne pine expectorant* rendered efficient service. The preparation is composed of a number of extracts, which act in the best meaning of the title as a true *anodyne*, and yet has the advantage of being very palatable.

Considering the great number of hay-fever sufferers in this country, I think my successful treatment of the disease will be a real boon to the afflicted. I would cheerfully request the profession to give this method of treatment a fair trial, and report the result.

1268 Lexington Avenue.

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*ON THE HYGIENE OF ASCARIS INFECTION.**

By J. Dewitz, M.D., Berlin, Germany.

THE extraordinary progress which bacteriology has made within the last decade has almost succeeded in eclipsing, if not totally obliterating, many a collateral science; for instance, helminthology. Fortunately, the latter entertains such vital relations to numerous questions of hygiene and health that it will ever sustain its important character. Quite recently significant discoveries have been made in this science which must engage the attention of all practitioners of medicine. Thus Braun has succeeded in determining in which animal the juvenile form of bothriocephalus latus lives; Grassi pointed out a tapeworm (*Tænia murina*) which, both in its immature and mature form, infests the intestines of one and the same animal; Leuckart and Thomas have elucidated the biological relations of *Distomum hepaticum*, the well-known foe of sheep. Of greatest interest, however, is the discovery of the development of the common round-worm (*Ascaris lumbricoides*). Formerly it was believed that the ascaris infection was a direct one,—*i.e.*, that the eggs of the parasite were transferred from man to man without intervention of an intermediate host. Even authorities like Davaine and Kuechenmeister advocated this supposition, which received an additional substantiation by the knowledge of the development of a related ascaris,—viz., of *Ascaris mystax*. This species occurs in the intestines of the cat, is identical with *Ascaris marginata*, which is found in the dog, and, as Leuckart has proven, develops without intermediate host. Still, in spite of all factors urging the belief in a direct transmission, the experiment gave always negative results. For that reason Leuckart,† in his well-known text-book on parasites, was induced to regard the existence of an intermediate host as necessary.

* Translated by J. Schmidt, M.D., Berlin, Germany.

† "Die Menschlichen Parasiten," vol. ii., 1876.

Linstow* pointed to small myriapodes (*Julus guttulatus* and *Polydesmus complanatus*) as possible intermediate hosts. Fortunately, Grassi, of Italy, and Lutz, a German physician of Brazil, were able to experimentally prove the *direct transmission of ascaris*. Grassi employed as object of experiment a boy aged 7, who, by proper anthelmintic medication, had been freed from all intestinal parasites, and in whose fæces no eggs could be ascertained by microscopic examination. The boy received in the last week of September a pill containing numerous ascaris eggs, which had already reached the embryonic stage. Twenty days later no eggs could yet be detected in the fæces. When, after an interruption of the examination, up to the close of November, the fæces were then re-examined, they were found to be teeming with ascaris eggs. The same boy took later a pill containing more than one hundred and fifty eggs (in their embryonic stage), and discharged one hundred and forty-three round-worms. During the course of the experiment every chance of infection was precluded. The proceeding instituted by Lutz is of considerable interest. The experimenter placed eggs in the state of development in a little bag of parchment paper, and gave the whole to a dog. When, after two days, the little bag was discharged with the fæces, all the eggs had remained together and were open to examination. It was found that a few embryos had escaped from the eggs. A second experiment was made on an adult, healthy man. This time the parchment bag had remained twelve hours in the intestines, and on being inspected showed numerous free embryos. The embryos were particularly numerous when the duration of the experiment was twenty hours. Another person, aged 32, ingested within twenty-three days six different doses of eggs. Six days after the last dose the person discharged a number of round-worms, measuring from five and a half to thirteen millimetres. The parasites were sent to Leuckart, and recognized as young human round-worms.

The reason of the failure of all previous experiments was also soon determined. In order to attain maturity in the human intestines, the eggs must previously reach a certain stage of development in a proper medium, such as damp earth or fæcal matter. Various helminthologists, such as Schubart, Richter, Davaine, and Leuckart, had a long time ago succeeded in producing the development of the eggs in water, whereby, however, the gelatinous enclosure of the egg-shell proper was destroyed. This protective enclosure is a necessary condition for the development of the egg. For, as Lutz believes, in the absence of this enclosure, the gastric juice is able to penetrate the shell and to kill the young worm, or the gastric juice may be enabled to dissolve the shell and to liberate the worm in the stomach, whereupon its destruction by the gastric juice would be inevitable.

The above experiments have thus proven that the human round-worm does not need any intermediate host for its development. The same holds true in regard to the round-worm of the cat, the dog, and very probably also to the large round-worm of the horse (*Ascaris megalocephala*).

The course of infection with ascaris is as follows: The eggs leave the intestines of their bearer with the fæces, remain for some time in damp earth and develop there, reaching the embryonic stage. The young worm reaches the digestive tract of man by means of impure water or earth, bursts the egg-shell, and, liberated, soon grows up as a sexually mature parasite.

The majority of helminths, as is well known, possess an intermediate host. Thus the human tapeworm (*Tænia solium*) lives as larva in the muscles of the pig, *Filaria medinensis*, in his immediate stage, in minute crustaceæ, occurring in drinking-water. *Distomum hepaticum*, mentioned above as the specific foe of sheep, passes his infancy in a small snail (*Limnæus truncatulus*).

An important point in the ascaris infection is the question as to the manner in which the ascaris eggs become scattered. In the foremost rank in this respect we have to place the irrational building of out-houses and general disposition of fæcal matters. Even in highly-civilized countries, such as Germany, the institution of privies is often of so primitive a character as to easily allow of the transmission of ascaris eggs, discharged with the fæces, to neighboring fields, gardens, and even water intended for drinking purposes. Only a solidly-built and carefully-closed well is safe against ascaris infection. In the court-yard, field, or garden the embryos enclosed in the eggs retain their vitality and capacity of development for a long time. It is clear that no great obstacles oppose themselves to the ingestion of the eggs after they are scattered over a court-yard or a garden. Children

* *Zoologischer Anzeiger*, 1886, p. 525.

playing with the sand, or workingmen employed there, might swallow them directly, or the eggs might be taken to the dwellings with sand sticking to the shoes and swallowed later. It is thus possible that infants, having never left the room, can become infected with ascaris. The creeping of small children about the room facilitates, of course, the infection.

The danger of acquiring the parasite is particularly great in farm-hands using fæcal matters as manure. Allow me to cite here an instructive case observed by Lutz, practising at the time in São Paulo (Brazil). The wife of a mason suffered from various digestive and nervous troubles. The microscopic examination of the fæces revealed an extraordinary quantity of ascaris eggs. The patient, treated at first with santonin, and later with thymol, discharged one hundred round-worms immediately and thirty more a few months later. The woman, who, according to Brazilian custom, never left the house, could have contracted the infection only in the house. The well was found to be in excellent condition, while the privy, which was of the most primitive nature imaginable, was at once suspected. The suspicion waxed into evidence when Lutz learned that the patient had from time to time used the fæcal matters as manure for her garden. Her husband, who was at work outside of the house, had remained uninfected. It is known that the infection may also be brought about by vegetables taken from such infected fields and cleaned imperfectly. Fruit picked up in the garden by children is a frequent factor of ascaris-poisoning. It is a noteworthy fact that the pig is a frequent transmitter of the ascaris infection, owing to its predilection of turning up fæces. The killing, too, of infected hogs can give rise to further infections. Lutz reports a case where the children of a German family became regularly infected whenever a hog was killed, which happened about once a week. To be sure, some authors, particularly Dujardin, deny the identity of the ascaris of the man with that of the hog. Still the morphological deviations are very insignificant, and can be explained by the great variability existing in the nematoides. Leuckart and Schneider are emphatic in regarding both species as identical, —a fact which the above-cited case of Lutz seems to prove too. It would be interesting to learn whether the employés of the great hog-killing establishments, who are engaged in cleaning the intestines of the animals, are more frequently attacked by ascaris than other people of the same town.

From the above explanations it will be seen why certain classes and certain ages are more liable to be attacked with ascaris than others. We can, therefore, mention as peculiarly liable to the infection farmers, the poor people in general, and the inhabitants of hot and unhygienic zones. I must also mention that the insane are extraordinarily frequent bearers of ascaris,—a fact to be explained by the lack of attention to cleanliness and hygiene shown by that class. It is left to explain why the parasite is particularly frequent in the fall. The explanation of this phenomenon is easy. The parasite needs one to three months for its development, and as the summer offers the best chances for the propagation of its eggs, we have to expect the grown-up worms in the fall.

In conclusion, it behooves us to recapitulate the hygienic measures and precautions which will protect us against the infection of ascaris. The arrangement, location, and seclusion of privies and closets is of prime importance. The same attention must be bestowed upon all wells, hydrants, and other sources from which our drinking-water is derived. In the hog-killing establishments the contents of the intestines and the water used to clean them ought to be burnt, especially rendered innocuous by boiling. All vegetables ought to be carefully cleaned before use. All worms found in man or animal ought to be burnt, and the fæces of infected persons be chemically treated ; for instance, by quicklime. Cleanliness, in one word, next to godliness, will, as in all instances, be the most potent safeguard also against this infection.

THE PHYSIOLOGICAL ACTION OF OUABAÏN.

By Joseph Sailer, M.D.*

(Continued from page 738.)

IT now remains to account for the stage of increased rapidity of the heart's action. As in the preceding stage, one naturally turns first to the cardio-inhibitory apparatus, in order to see if any action here would account for the sudden alteration in the pulse. Obviously there are three ways in which this function could be affected in order to pro-

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duce the result that occurred,—first, by paralysis of the cardio-inhibitory centre; second, by paralysis of the cardio-inhibitory nerves; and, third, by the combined effect of both actions. Now it would be very difficult to definitely prove that the cardio-inhibitory centre was actually paralyzed, and it would be practically impossible to discriminate the third way from the second; but paralysis of the peripheral vagi is very easily tested by simply exposing one of the nerves and stimulating it with the induced current. Accordingly, a dog was taken, and prepared exactly as the dogs of Series A, excepting that a loose loop was passed around the right pneumogastric nerve. A moderate dose of the drug was employed (.003 gramme for 17.5 kilos). At two minutes the rate was 162 per minute; at two minutes and ten seconds it was 240, and the typical second stage was in progress. At two minutes and thirty seconds, when the rate was 225, the nerve was stimulated with a moderate current. In the succeeding ten seconds there were 43 beats, or a rate of 258; absolutely no result could be seen in the cardiogram. In ten seconds the electrodes were again applied to the nerve. In the following period of ten seconds there were but 35 beats, but this was by no means due to any action of the current, for the slowing occurred during the last two seconds, and not while the electricity was acting; and, indeed, it became evident within a very brief time that it was purely due to the rapidly-developing paralysis of the heart, for at three minutes and thirty seconds the cardiogram showed the straight line of death, broken but here and there by a slight elevation, to correspond to the decreasing respiratory movements. It is, perhaps, of value to note that the respirations showed a slight increase after the first stimulation, the rate increasing from 18 to 27 per minute. Perhaps this is due merely to the irregularity of this function that always occurred in the second stage. Perhaps it indicates that it is but the peripheral termination of the vagus that is paralyzed, and that the nerve-trunk, as must likewise have been the centre, was still intact. Fortunately, there are other experiments in this series.

In II. C a very small dose was employed (.001 gramme for seven kilos, repeated once). At three minutes the first stage was still pronounced; but, it being thought advisable to test the apparatus, the right pneumogastric was stimulated with a moderate induced current. Immediate arrest of cardiac movement resulted. When it resumed, the dog began to struggle violently, and the cardiogram became so irregular that it was impossible to count the beats. During this period, which lasted forty-five seconds, the blood-pressure suddenly rose, and when it became again possible to count the beats, it was evident that the second stage had been entered upon. The electrodes were again applied to the nerve from six minutes and twenty-four seconds to six minutes and thirty-two seconds. The heart's action did not cease, but a marked alteration occurred in the character of the cardiogram, and the rate dropped from 225 to 186. A moderate current was employed, but when at seven minutes the rate had again risen to 218, and the cardiogram had resumed its former characteristics, the secondary coil was made to cover the primary, and the nerve once more stimulated. Alteration neither in rate nor character occurred. The nerve had ceased to transmit stimuli. At seven minutes and fifty seconds a large dose of ouabaïn was thrown into the external jugular, and the heart suddenly stopped beating. If, from the first experiment, it might be concluded that late in the poisoning the pneumogastrics were paralyzed either in the trunk or the peripheral termination, it is evident that one can go two steps further in drawing conclusions from the second. For it is clear, first, that the pneumogastrics during the first stage are either normal or stimulated. Most unfortunately, I did not possess, nor had access to, the delicate electrical apparatus necessary to determine the response of the heart to small-measured currents acting upon the nerve, or I could easily have determined whether the heart in the first stage was stopped by a weaker current than that required to stop it before the drug was administered. But to return to the deduction: it is clear, in the second place, that the nerve or its terminals are paralyzed late in the second stage; and third, as I take it, the results of the second stimulation prove that this paralysis comes on gradually during the second stage, if an action that reaches completion in a stage that ordinarily occupies less than a minute can be called gradual.

III. C may be analyzed briefly. Its results are completely in accordance with the two preceding. Again, a minute dose was employed (.00075 gramme in eight kilos; as it was repeated four times, in the end nearly .004 gramme was injected, but the effect did not seem to be so marked as when a single large dose is used). At first there was no percepti-

ble effect upon the heart's rate, although the blood-pressure responded markedly to the action of the drug; but at twelve minutes, by the time the fourth injection was administered, the first stage had become well pronounced. At thirteen minutes and twenty seconds the rate was 108; at thirteen minutes and forty seconds it had risen to 144, and continued steadily to increase. At fourteen minutes and ten seconds the right vagus was touched with the wires for a moment. Immediate stoppage of the heart occurred, and about five beats were lost. As soon as the heart recovered, the increase in rate continued. At seventeen minutes the rate had increased to 116; at seventeen minutes and two seconds the electrodes were once more applied, a strong current being used. Immediate stoppage of the heart's action, accompanied by fall of pressure, occurred, and lasted for three seconds, the period of application. For the next ten seconds the cardiogram was very irregular. At seventeen minutes and twenty-one seconds, less than twenty seconds later than the last application, the vagus was again stimulated without perceptible effect. Dr. Reichert was kind enough to supervise my own applications, and then to apply the wires himself, so that there can be no error in the observation. It is clear, from this experiment, that, very shortly after the vagi are completely paralyzed, death ensues. This could not be demonstrated in the second experiment, because of the employment of a large dose of ouabaïn to kill the dog.

The cause of the final arrest of the heart is not so difficult to elucidate. Examples have already been given showing how sudden and rapid this arrest is. From the two experiments to determine the general action, as well as from several of the kymographic experiments, in which the dogs were opened after death, it was conclusively demonstrated that the heart-muscle was completely paralyzed, often failing to respond, within five minutes after death, to induced currents that caused violent contraction of the voluntary muscles. That this arrest took place as soon and as completely in the isolated heart may be shown by the following experiment:

I. D.	m.s.	Per min.
	.00	120
	.003 gramme.	
	.10	120
	1.10	132
	2.10	138
	2.40	126
	2.50	?
	3.00	0

The results of the other experiments, in which section of the cord and vagi was practised, are strictly in accord with this, and it is scarcely worth while to give them.

I.

The action of ouabaïn upon blood-pressure has necessarily been alluded to in the section upon its action upon the heart, but it will be expedient here to give it a more extended consideration. Like the pulse-rate, the blood-pressure curve may conveniently be studied in three stages. The first corresponds to the stage of cardiac inhibition. As a rule, there is a distinct but gradual rise of pressure during this period, especially marked when the heart's action is regular. The following table exhibits the results of the normal experiments; only the mean pressure is given:

m.s.	I.	III.	IV.	VI.	VII.
.00	73	75 5	55	46.5	56
	.003	.0015	.003	.002	.0025
.10	74	76.5	55.5	47.5	60
.20	76	81	58.5	51	...
.30	74.5	84	57.5	53	...
	.003				
.40	74	83.5	61	54	75
.50	75.5	83.5	64.5	53	72
1.00	74	87.5	70	54	70.5
1.10	79	87.5	73.5	55.5	70
				.002	
1.20	77	88	76	55	70
1.30	77	89	80.5	57	...
1.40	75.5	90	88	54.5	...
1 50	...	92	90	54	...
2.00	...	...	88.5	54	...

In these instances the rise is fairly constant and considerable; but it happened quite as frequently that, instead of a primary rise, there occurred a fall of blood-pressure in the dogs of Series A. In order to render comparison more easy, I have prepared another table, in which these cases also are collected:

m.s.	II.	V.	VIII.	IX.
.00	54	53	64	65
	.005	.0025	.005	.005
.10	56	51.5	72.5	71
.20	57.5	57	79.5	69
.30	55	61	67	69
.40	44.5	59.5	59	61
.50	34.5	53	55	64
1 00	...	55	51	56
		.0025		
1.10	...	54.5	54	59
1.20	34	56	58	66
1.30	40.5	54	64	...
1.40	43	40 5	...	...
1.50	47	41.5	...	...
2 00	50	27.5	...	...

It will at once be apparent that a point of difference between these two series of experiments lies in the size of the dose. In the first series, the largest amount injected at one time was .003 gramme, and the largest total amount .004 gramme, and this in a dog of twenty-two kilos. In the second series, .005 gramme was given in every case but one, and then .0025 gramme was repeated once; and except in this instance the dogs all weighed less than ten kilos. Evidently, then, the size of the dose has much to do with the effect of the drug. It is interesting, at this point, to refer to Series C, in which it was desirable, for the purpose of prolonging the action, to administer very small doses. Thus in I. C the dose was .003 gramme in 17.5 kilos. The record is as follows:

m. s.	Per min.
.00	54
.003 gramme.	
.10	58.5
.40	64.5
1.20	65.5
2.00	57.5
2.10	73
2.40	83
3.20	71
3.50	0

Here there is evident a fairly steady rise during the first stage; then a sudden marked rise during the second; and a final rapid decline, reaching the zero-point, it is worthy of note, some twenty seconds after the heart had stopped beating. In II. C this is even more regular. The dose was absolutely and relatively smaller (.001 gramme in seven kilos), and, although repeated, seemed to affect the dog less severely. I have observed in several experiments that repeated small doses, even when the aggregate is greater, seem to have less effect than a single large dose. The tracing gives the following record:

m. s.	Per min.
.00	66
.001 gramme.	
.10	60
.40	72
1.20	78.5
1.50	82
.001	
2.00	86
3.00	85.5
3.30	93.5
3.40	109

It will be noted that the rise is almost uniform. The injection of the second dose did, indeed, cause a temporary irregularity, perhaps due to the irregular heart action it produced, but a few seconds later, at three minutes, the steady rise had recommenced. Cardiac action was also disturbed on this occasion by stimulating one of the vagi, but without interfering with the upward movement of the mercury. But perhaps the most instructive record is that of the last experiment of the present series. A very minute dose was employed (.00075 gramme for eight kilos), and, although repeated four times, in no instance did there appear to be any immediate result from the injection. Again, the heart for a long time was scarcely affected. The following are a few extracts showing the general run of the curve:

m. s.	Per min.
.00	64
.00075	
.10	62.5
1.00	61 5
2.00	61
.00075	
2.30	62.5
3 20	66.5
4.20	67.5
5.20	67
.00075	
5.40	67
6.40	67
Stopped 4 minutes.	
11.00	68.5
.00075	
11.20	69
11.40	74
12.20	81.5
13.20	89
13.40	102

It is very clear from this table that there is, under a moderate dose, a continuous rise in blood-pressure. As in the other tracings, this is progressive up to a certain point, when it increases suddenly, slowly reaches a higher point, decreases again, and finally falls rapidly to zero.

To determine the influences producing the various changes in the vascular system is much more difficult than to determine those of the heart. Taking first the primary rise that occurred in the majority of the experiments, it is obvious that it can be accounted for in three ways,—namely, first, increased cardiac action; second, stimulation of the vaso-motor centre; third, stimulation of the peripheral vaso-motor nerves or the walls of the arterioles themselves. Practically it is so difficult to distinguish the two conditions under the third head that it is not worth while to separate them. Whether or not the vaso-dilator nerves are concerned is scarcely important, and as it is not yet determined

that their action is continuous, it is possible that they might be affected without producing any alteration in the tracing. Leaving the heart for the time being, it can most readily be demonstrated whether the vaso-motor centre itself is acted upon. This is done by section of the cord and pneumogastric nerves, of course employing artificial respiration, unless the section be very low, and noting if the pressure still rise and to what degree. Numerous experiments were made to decide this point; but, unfortunately, in only two of them am I sure that the division was complete. At first I relied upon the symptoms of paralysis, and neglected to dissect the part; but, having found this an uncertain guide, I performed careful autopsies upon the last three dogs, with the results of finding in the one the cord only partially cut through, and in the other two complete section. As a matter of fact, whether it was certain or not that the spinal cord was completely severed, the result was always the same. Blood-pressure rose steadily and persistently, and very considerably, until near the moment of dissolution. On the other hand, cardiac action was not, or but slightly, accelerated; and the cardiograms were, if anything, weaker under the influence of the drug than without it. In I. and II. D successful attempts to cut the cord were certainly made. The first dog weighed twelve kilos, the second eight kilos:

m. s.	I. Per min.	II. Per min.
.00	8	15
	.003	.005
.10	9	15.5
.40	12	28
1.20	15.5	49
1.40	17	51.5
	.002	
2.00	20.5	60
2.20	24	57
2.40	19	57
3.00	3	51
3.30	...	5

There is but little comment to make in either instance. The two experiments, agreeing, as they do, so closely, prove conclusively to my mind that the vaso motor centre is certainly not the point on which the drug acts in order to cause the rise in blood-pressure. In both cases the cord was completely cut in the cervical region, and artificial respiration was required. In I. the dog was profoundly shocked, but recovered well when the tube was inserted. The drug was not administered until the heart's action had been steady for some minutes. I tabulate for reference the remaining experiments. The first two comprise the dogs in which paralysis was taken to indicate complete section of the cord. The third is the dog in which the autopsy showed the cord but partially severed, the right lateral column and anterior root zone remaining intact.

SERIES D.

m. s.	III. 11 kilos.	IV. 5 kilos.	V. 11½ kilos.
.00	46	53	53
	.005	.003	.003
.10	47	55.5	63.5
.40	65	70.5	94
1.20	74	89.5	106
2.00	79	86.5	90
	.005		
2.40	79	12	0
3.20	16	...	...

Evidently if, when the influence of the vaso-motor centre is wholly or partially withdrawn, the blood-pressure can still rise so rapidly, the rise occurring in the normal animal can scarcely be supposed to be due to stimulation of the centres in the medulla. It is, perhaps, permissible to draw an inference here regarding the primary slowing of the heart. It is uncommon for a drug to stimulate the cardio-inhibitory centre and depress the vaso-motor centre at the same time, or to act in any manner upon the cardiac centre without influencing the vaso motor centre. As it is highly probable, then, that some portion of the inhibitory mechanism of the heart is stimulated during the early stage of the administration of ouabaïn, and as it seems unlikely that the vaso-motor centres are acted upon, it seems reasonable to suppose that it is the pneumogastric nerves that feel the effect of the drug. This is rendered more probable by the known fact that these same vagi are, in the later stage, depressed, and finally paralyzed. A further argument in favor of this primary stimulant action, followed by depression and paralysis, is seen in the study of the frog's heart, where exactly this sequence is followed, although the first effect is so great as to stop cardiac action, and the paralysis can only be demonstrated after relaxation ensues, by application of the electric current. It would seem almost as if the vaso-motor centre were depressed by the drug, so that when it is cut off, the stimulating effect upon the peripheral vaso-motor system can show its true magnitude, for rarely in the experiments of Series A is there anything like the same amount of rise. The question, however, is too complicated to be so easily decided. When the blood-pressure

is raised by spasm of the arterioles in the normal dog, there is coincidently stimulation of the cardiac centres of the medulla, and the heart's action is slowed (Brunton); this slowing, of course, reduces blood-pressure again, and a state of equilibrium is maintained. Under abnormal conditions, the centres make the same effort to maintain a normal pressure, with more or less success. If, however, the vagi are divided, it is impossible that the effort of the centre be manifested. Indeed, the stimulation of the accelerator nerves in the cervical sympathetic might, under some circumstances, be sufficient to cause acceleration of the pulse, this in time serving to further increase the pressure. Hence it cannot be asserted that, because the increase in blood-pressure is more marked in Series D than in Series A, the vaso-motor centre is, therefore, from the first depressed by ouabaïn, although not enough to overcome the vascular spasm. It is not, however, absolutely true that the rise from the moment of injection is invariably more marked in D than in A, for in I., of the former series, in which the cord was undoubtedly cut, the rise was only relatively pronounced.

Regarding the influence of the heart, the question is not, Does the heart influence blood-pressure? for the heart must always, by the rapidity and force of its contraction, have a decided influence upon arterial tension, but rather whether the alterations in the height of the column of mercury are due wholly or in great part to the changes in this organ. Various methods have been devised to determine this point. Perhaps the least reliable is the microscopic observation of the arterioles in the mesentery of a rabbit to which the drug has been administered, and its value is not greatly enhanced by the modification of the so-called jury system. Indeed, I know of an instance in which the gentlemen engaged were unable to agree as to whether contraction or dilatation occurred. Observing the variations in the movement of the needle during the ventricular diastole, artificially slowing the heart, if necessary, by stimulating a pneumogastric with a weak current, is perhaps of more value; but either because the conditions were unfavorable, or, as is more likely, because I have not yet acquired sufficient skill in analyzing tracings, I was unable to derive any information from this source. Probably the most reliable method is the performance of cardiectomy upon the tortoise and passing a normal salt solution or defibrinated blood through the vessels, noting carefully the alterations in tension induced by the addition of the drug to the liquid. This required apparatus to which I did not have access. As a result, I was compelled to depend upon the old method of comparing the pulse and the pressure-curves to discover whether they were parallel or divergent.

The following records of experiments show, as well as figures can, the results obtained:

I.

m. s.	Pulse.	Pressure.
.00	114	74
	.003	
.10	114	74
.20	102	76
.30	90	74.5
	.003	
.40	102	74
1.00	84	74

II.

m. s.	Pulse.	Pressure.
.00	162	54
	.005	
.10	150	56
.20	132	57.5
.30	120	55
.40	108	44.5

III.

m. s.	Pulse.	Pressure.
.00	231	75.5
	.0015	
.10	222	76.5
.20	222	81
.40	216	83.5
1.20	186	88
2.00	156	91

IV.

m. s.	Pulse.	Pressure.
.00	163	55
	.003	
.10	156	55.5
.20	114	58.5
.30	84	57.5
.40	72	61
1.00	72	70

Without going further, it will, I think, be apparent, from the results of Series A, that, if this method be correct, the vaso-motor system is affected independently of the heart, at least during the first stage. Thus, while the pulse-rate falls in III., the pressure rises, and a beautiful crucial effect is produced. This is even more pronounced in IV., and is clearly indicated in all the others.

I.

m. s.	Pulse.	Pressure.
.00	210	72.5
	.002	
.10	210	77.5
.30	222	89
1.00	252	98
1.30	252	102

III.

m. s.	Pulse.	Pressure.
.00	258	85
	.002	
.10	246	85
.20	252	91
.30	246	95
.40	192	95

It does not appear to be so well marked in Series B, excepting in III., where it is quite decided. In I. the pressure rises at first much more rapidly than the pulse, confirming the induction of a primary vaso-motor spasm. Parallelism is, however, pronounced in II. and IV.

rise occurs in V. of this series (in which, it will be remembered, complete division was not secured). In this the pressure rose from 53 millimetres to 115 millimetres in one minute and ten seconds, while the pulse-rate advanced from 156 to 168 per minute, and then fell to 144 in the same period. Then,

I.

m. s.	Pulse.	Pressure.
.00	117	54
	.003	
.10	120	58.5
.20	102	61
.30	84	66
1.00	102	69

II.

m. s.	Pulse.	Pressure.
.00	228	66
	.001	
.10	222	66
.30	210	67
.50	180	75
1.10	150	78.5
1.30	126	80

III.

m. s.	Pulse.	Pressure.
.00	132	63.5
	.00075	
.10	138	62.5
	.00075	
2.30	138	62.5
	.00075	
5.40	152	67
	.00075	
11.20	138	69
12.20	90	81.5
13.20	108	89

In Series C, where, perhaps, on account of the smallness of the dose, the delicate indications are exaggerated, this primary spasm is very clearly seen. In I. and II. it is quite pronounced, and although developing more tardily in III., in the end it is here also very evident. The same holds true for

although the pulse-rate fell at a single beat to 48, and never afterwards rose above 66, the pressure remained above 100 until two minutes and ten seconds, then fell slowly, then more suddenly, until at three minutes it was zero. I give here the records of the other experiments of this series :

I.

m. s.	Pulse.	Pressure.
.00	120	8
	.003	
.10	120	9
.50	132	14.5
1.50	132	18.5
	.002	
2.20	144	24

II.

m. s.	Pulse.	Pressure.
.00	180	15
	.005	
.10	180	15.5
1.00	192	42.5
2.00	174	60
2 30	162	56

III.

m. s.	Pulse.	Pressure.
.00	198	46
	.005	
.10	198	47
.30	210	59
1.00	228	69
1.30	222	76
2.00	210	79

IV.

m. s.	Pulse.	Pressure.
.00	156	53.5
	.003	
.10	150	55.5
.40	162	70.5
1.20	162	89.5
2.00	180	86.5

Series D, and, as has already been said, it indicates the peripheral character of the spasm, for the great vaso-constrictor centre is absolutely shut off when the cord is severed. Perhaps the most extraordinary example of the rapidity and magnitude of the pressure-

In these the vaso-motor spasm is well marked. Even in I., in which the dog suffered from profound shock during the operation upon the cord, yet, although the pressure remains low, it clearly rises out of proportion to the pulse-rate.

It seems to me, then, to be conclusively demonstrated that ouabaïn, injected into the external jugular vein, has an effect upon the vaso-motor system independent of that which it exerts upon the heart, and causes a vaso-motor spasm, either by stimulating the peripheral vaso-motor nerves or by acting directly upon the walls of the arterioles. In a few cases, however, a fall of pressure occurred, associated, it will be remembered, with large relative doses. It was also invariably associated with great reduction of the cardiac rate, a reduction closely corresponding to the fall of pressure, and to my mind explaining it. There is one exception to this. IV. B shows a fall of pressure without corresponding fall in pulse-rate, and is at present inexplicable to me. It is easy to suggest that some unsuspected disturbing element affected the experiment; but, unfortunately, such an explanation is little satisfactory, however plausible, in scientific investigation.

The rise in pressure in the second stage corresponds closely to the increase in the pulse-rate, and can readily be explained by it. That it does not depend upon this alone is evidenced by the results appearing in Experiments III. and IV. of Series A. Thus, in III., at three minutes, the pulse-rate was 168 and the pressure 95. At five minutes and ten seconds the figures were: pulse 174 and pressure 119; at five minutes and thirty seconds, after the injection of .003 gramme of ouabaïn, 168 and 124.5; at five minutes and fifty seconds, 225 and 120.5. Here is a rise of pressure entirely disproportionate to the increase in pulse-rate and not to be explained by it. In IV. the rate at two minutes and thirty seconds was 252, the pressure 93. At three minutes it was 240 and 94. At three minutes and thirty seconds, 220 and 106; again a disproportionate increase of the pressure.

As blood-pressure does not fall to zero until some seconds after the heart has ceased to beat, it may be inferred that ouabaïn does not act so fatally upon the non-striated muscles of the arteries as it does upon the heart. Indeed, it seems to act upon the heart-muscle with peculiar rapidity and virulence. Perhaps, as M. Arnaud suggests, we shall some day discover a certain chemical nucleus, whose combinations have their dominant action upon the branched, striated myocardium.

In conclusion, then, it appears that ouabaïn causes, first, a slowing of the pulse, due to a stimulating action upon the cardio-inhibitory function, and perhaps partly to a direct action upon the heart-muscle. At the same time there is a primary vaso-motor spasm, due to an action either upon the vaso constrictor fibres or the muscular coats of the vessels. The slowing of the heart may be so marked, in exceptional instances, as to overcome the vaso-motor spasm and cause a fall of pressure. Then there is a sudden and great increase in pulse-rate, caused by depression and final paralysis of the vagi, and, at the same time, increase in pressure, due partly to increased heart-action and partly to continued stimulation of the vaso motor system. At last the heart-muscle is paralyzed, and in a few seconds the pressure also falls to zero.

II.

I have already alluded to the statement of MM. Varigny and Langlois that animals to whom ouabaïn has been administered die with well-pronounced symptoms of asphyxia, and I have already unqualifiedly rejected it. In my notes of the various experiments performed upon dogs, I find that special mention is made of the continuance of respiratory action after death in Experiments I., II., III., IV., V., VIII., and IX., out of nine experiments in Series A, and in VI. the dog was killed by chloroform. In Series B, in which the vagi were cut, it is mentioned in Experiments II., III., and IV., out of four experiments. In Series C, in which the dogs were practically normal, in Experiments I. and III. out of three, and in II. the dog was killed by a massive dose of ouabaïn. Indeed, after the record of III., I find a note stating that respiration continued until twenty minutes and forty seconds, cardiac movement having ceased at seventeen minutes and fifty seconds, there being thus nearly three minutes before paralysis of the respiratory centre finally ensued. Finally, in Series D, in Experiments III. and IV., in which the cord was cut in the dorsal region, I again find the persistence of respiratory action noted,—in III. for forty seconds. In V., in which the cord was not quite severed in the dorsal region, although complete paralysis promptly ensued and remained, there were, after the heart had ceased beating, and the canula had been removed from the trachea, peculiar movements of drawing the head forward, caused by contraction of the sterno-laryngeal muscles. Now, as these are accessory muscles of respiration, and probably draw their nerve-supply from a point above the section of the cord (the exact location of the section, beyond the fact that it lay between the third and sixth

cervical vertebræ, was not ascertained), it seems likely to me that these movements were but manifestations of vigorous respiratory impulses emanating from the centre. If this induction is correct, it forms another link in the chain of evidence that supports the suggestion that the bulbar centres are not greatly affected by ouabaïn, and would locate the seat of its action on the cardio-inhibitory function in the peripheral part.

These results, added to the invariable distention of the ranine lung in the numerous experiments I performed upon frogs, seem to me sufficiently conclusive, for it is to be remembered that in none of the experiments not adduced as examples is there any suggestion at all that the pulse continued after respiration. Nevertheless, MM. Varigny and Langlois make these most positive statements: "More often it produces a respiratory slowing, and the heart survives the respiration some minutes. In order to exclude the risks of direct action upon the endocardium, we prefer to inject the poison (always by the veins) in very diluted dose,—that is to say, a dose of a milligramme in a cubic centimetre of water,—and dividing the injection. [My own injections were always considerably more diluted than this.—J. S.]. Under these conditions we observe the following: If the dose be weak, four milligrammes for a live weight of six kilos, 300 [it must be remembered that these gentlemen did not use ouabaïn, but the crude drug, as prepared by the natives.—J. S.], one observed, at the end of one or two minutes, sometimes less, a pronounced respiratory slowing, without well-marked cardiac troubles. This slowing lasted one or two minutes, and was gradually dissipated. The animal recovered without difficulty and without other troubles. With stronger doses (eight milligrammes for a weight of five kilos, 550, injected in four parts, in a half-hour) the first troubles manifested themselves again on the side of respiration. There is produced acceleration of brief duration, but well marked, and which is almost at once followed by a retardation, gradual enough, but which does not last more than from one to three minutes. This retardation goes on to complete arrest, the heart continuing to beat for some time, but slowing also, to finish by being arrested." The arrest of the heart, they admit, cannot be prevented by artificial respiration, but they affirm that there is a dose that will arrest respiration, but not the heart. "In the presence of these results," they continue, "it appears to us legitimate to conclude that the action of ouabaïn is upon the centres of innervation of the respiration and the heart,—that is to say, upon the medulla." MM. Gley and Rondeau also believe that "ouabaïn exercises a real action upon the medulla, as is proved by the varied respiratory troubles that follow the administration of the substance." Rather slender grounds for the conclusion, it seems to me.

The following (see page 823) is a table of my own results with this function.

These results confirm, in some measure, the statement of MM. Varigny and Langlois, that there is a slowing, followed by an acceleration, of the rate. The slowing did not appear in II., nor the acceleration in V. and VI. Occasionally, as in IV., the acceleration was very pronounced, and in such cases occurred during the moment of dissolution. In III., of Series C, the respiratory rate was not taken during the experiment, but at death, just after the heart stopped, it is recorded upon the sphygmogram as rising to the enormous rate of 276 per minute, and this lasted some seconds. My attention was attracted to the dog at this time. The respiratory sounds could not be discriminated, but sounded like a low, continuous hiss. The movements were exceedingly shallow; the hand placed upon the thorax perceived a rapid tremor, and the muscles rigid with the tremendous exertion. As in both this instance and in IV., where the rate reached 108 per minute, the acceleration occurred about twenty seconds after the heart had ceased to beat, it seems to me that it can be readily accounted for by ascribing it to the stimulating effect upon the respiratory centre of the unrefreshed blood, ending, of course, in rapid paralysis. As the period of slowing almost invariably occurred in connection with rising pressure, it may be explained by that fact; for, when the centre receives a greater supply of oxygenated blood, the rate is slowed. The ordinary acceleration always occurred during the second stage, and must in some manner be connected with it. But its rapid, shallow character is very unlike that of depressed vagi. If it be true that, in this second stage, there are contractions of the arterioles, it may be that the medulla is, in fact, anæmic, and hence stimulated. But one is almost tempted to ascribe the increase in rate to centric action, as is indeed commonly done when the experiments have not suggested anything else. But there is no more reason for adopting this explanation than any other. MM. Gley and Rondeau, however, consider the irregularities in the

respiratory rate to be proof that the action of ouabaïn is centric. Certainly irregularity is often marked, for sometimes the respiration will be delayed in expiration, sometimes in inspiration, and in one instance there was a beautiful tracing of Cheyne-Stokes respiration. I do not believe, however, that the premise is correct.

m. s.	I.	II.	III.	IV.	V.	VI.	VII.	A.	I. C.
.00	18*	...	...	...	45	24	42	...	18
.00	24	12	26	34	45	24	42	...	15
.10	18	12	27	30	45	24	60	...	15
.20	18	12	24	30	48	24	...	...	15
.30	17	12	24	33	45	24	...	...	15
.40	24	12	24	27	36	24	54	...	12
.50	18	12	21	36	42	24	45	...	18
1.00	21	...	...	30	42	24	24	...	18
1.10	24	...	15	24	33	23	30	...	18
1.20	24	36	18	20	21	24	48	...	18
1.30	24	36	18	24	15	21	...	...	15
1.40	24	42	21	24	21	18	72	...	12
1.50	...	42	21	24	21	18	...	...	12
2.00	...	36	24	42	30	18	..	...	9
2.10	...	...	...	60	...	...	54	...	6
2.20	34	36	...	54	39	...	0	...	18
2.30	30	60	...	36	39	...	...	...	18
2.40	24	52	18	48	36	18	...	...	18
2.50	18	...	18	60	36	18	...	...	27†
3.00	60	24	18	18	42	18	...	...	18†
3.10	84	12	15	36	36†	21†	...	...	12
3.20	84	...	...	48	36†	21	...	...	9
3.30	...	...	...	40	42†	24	...	...	9
3.40	...	...	...	30	...	18	...	...	0
3.50	...	...	...	27	...	15	...	...	...
4.00	...	...	...	30	...	...	...	...	...
4.10	...	...	...	108	...	...	...	...	...
4.20	...	...	...	...	18	...	...	...	...
4.30	...	...	...	...	21	...	...	...	...
4.40	...	...	...	...	15	...	...	...	...
4.50	...	...	...	...	12	...	...	...	...
5.00	...	...	...	...	12	...	...	...	...

* These figures represent the rate per minute.

† Stimulated right vagus.

III.

The action of ouabaïn upon the nervous system presents many interesting features. To elucidate these I have depended mainly upon the frog; but it will be best to preface the study of these experiments by a few results gleaned from my work upon mammals. From the second general experiment upon the dog, it is evidenced that there is a stage of cutaneous anæsthesia. As the reflexes appear to be abolished, although co-ordination was preserved, it seems to me that the affected point must be below the cord, and therefore in the trunk or sensory nerve endings. Probably the latter, as the results of the work on frogs, to anticipate a little, do not indicate that the nerve trunks are paralyzed before death, and it is, indeed, evident that in dogs the motor nerves remain intact.

Another interesting phenomena was the frequent occurrence of a brief tetanic convulsion terminating the sphygmographic studies. This occurred as follows: In Series A, in Experiments II., III., IV., VII., IX.; in Series B, in I., II., III.; in Series C, in I., II. In all these the convulsive action included all four extremities. In Series D no convulsions occurred except in IV. In this instance the cord was cut in the dorsal region, and the convulsion occurred in the anterior extremities alone, thus indicating that the disturbance was cerebral. As these convulsions do not occur in frogs, the following quotation from Landois and Stirling's "Physiology" will, I take it, serve as an explanation for them: "In the medulla oblongata, just where it joins the pons, there is a centre, whose stimulation causes general spasms. This centre may be excited by suddenly producing a highly venous condition of the blood ('asphyxia spasms'), in cases of drowning in mammals, but not in frogs.' And this from Lauder Brunton: "If any drug, therefore, produces convulsions in the higher animals and not in frogs, the probability is that its convulsant action is indirect and the convulsions it produces are asphyxial."

In these investigations one obtains but little assistance from the literature of the subject, for MM. Varigny and Langlois state that "ouabaïn does not appear to exercise any effect upon sensation, motion, or the reflexes." And MM. Gley and Rondeau maintain a prudent silence regarding the nervous system.

In considering the frog, I shall not undertake to make close analyses of all the experiments performed upon these animals. They were quite numerous, and yielded very concordant results. I have already given a brief description of the general action upon this animal. The diminished reflexes were noted, and also what, I think, the probable explanation,—namely, the condition of general anæsthesia. As in dogs, I believe this to be due to paralysis of the peripheral sensory nerves, for the nerve-trunks seem not to be wholly paralyzed at the moment of death. The nerve-trunks, however, are certainly affected by the drug. Thus in one case a moderate dose was employed; injected at 7.56 P.M. This experiment is somewhat remarkable, and I give the details briefly:

7.58 Respirations rapid and vigorous; the lower jaw is dropped.
8.00 Still very active.
8.05 Mouth closed.
8.08 Reflexes abolished; apparently complete anæsthesia and relaxation.
8.14 Muscular spasm; the muscles immediately relaxed; probably dead.

This is the only record of such an event that I can find in my notes. At present I cannot recollect whether it was a true spasm, or an effort to jump, or one of the swimming movements. At any rate, it occurred just before death.

8.17 All muscles respond to the faradic current.

Section.—Lung expanded; ventricle arrested in systole; not responsive to faradic current; sciatic nerve stimulated, followed by contraction of the muscles of the leg. Frog decapitated,—*i.e.*, all cardiac nerves cut,—but the ventricle remained contracted.

8.45 Muscles and nerves no longer respond to galvanic stimulus.

This was entirely too soon for absolute neuro-muscular paralysis to occur. The fact that the muscles did not respond when the electrodes were applied directly to their substance, indicated that their parenchyma was paralyzed, and that their motionless state did not depend upon the nerve paralysis. But the experiment did not prove that the nerves were paralyzed at all, for, supposing that they were not, how could it be demonstrated if the muscles were passive? This experiment was frequently repeated, with essentially the same results, except that in some cases the condition of paralysis to electric stimuli occurred at a shorter interval after death.

In order to satisfy myself that ouabaïn and not death affected the muscles, I tightly ligatured one leg of a frog above the knee, and then administered the poison. In every experiment the muscles below the ligature seemed endowed with immortality, and I invariably gave up in despair the attempt to discover how long they maintained vitality. I at least convinced myself that it was several hours. Among this series occurred the following interesting experiment. It shows, perhaps, better than any other, the alternations of the phases of profound paralysis and voluntary movement. I therefore give the details. The animal was small. A tight ligature was placed around the right thigh.

4.08 A large dose of ouabaïn injected hypodermically.
4.11 Still active.
4.12 Swallowing air rapidly.
4.14 Sensation good.
4.15 Sensation much impaired.
4.16 No effort made to turn over when laid on back.
4.17 Temporary gasping movements.
4.18 Swimming movements.
4.19 Sensation absolutely abolished; apparently dead.
4.24 Swimming movements.
4.25 Dead.

Section.—The ventricle arrested in systole; the auricle dilated and full of blood; the lungs greatly distended.

Electrical Reactions; Faradic Current.—Left leg at first fully responsive, but later requiring stronger and stronger currents. The sciatic nerve was exposed, and at first contraction was produced when it was stimulated by a moderate current; but later there was no response to the strongest. In the right leg the muscles were throughout responsive to the weakest current. Stimulation of the sciatic nerve by the weakest current caused contraction in the muscles of the leg.

It now remained to discover if the nerve was or was not paralyzed. In order to accomplish this, the sciatic of one leg was dissected out, and a ligature passed under it and around the leg. I prefer this to ligation of the femoral, as it practically prevents osmosis, an important consideration in experiments that must be continued some time after death. One of the experiments yielded the following results:

8.50 Hypodermic injection of moderate dose of ouabaïn.
9.12 Up to this time the animal had made frequent efforts to vomit, and had grown progressively

weaker, although sensation remained good and it moved away from irritation.

9.14 Sensation to pressure upon the ankle was gone, but quite good when the nerve-trunk itself was stimulated.

9.24 Sensation to pressure in the right ankle still faintly evident (the ligature had been placed around the right thigh), but completely abolished on the left side.

9.25 Sensory functions of left sciatic almost abolished and reflexes much delayed; response of right sciatic very prompt.

9.26 Sensation wholly abolished in both nerves; motor functions of both good and apparently equal.

9.28 Dead; has become enormously distended in the last five minutes.

9.34 Left sciatic requires a stronger current than the right to produce the same effect.

9.37 Right gastrocnemius responds promptly and vigorously; left, very feebly.

9.38 Muscles of back respond to moderate current.

9.39 No response in left leg; very marked response in right leg.

9.50 Abdomen opened and lumbar plexuses exposed.

9.54 Muscles of right leg respond to stimulation of either lumbar plexus; those of left leg motionless.

10.05 Muscles of all parts of body fail to respond to the electric current, except in the right leg, where contraction is prompt and vigorous to a weak current.

This experiment was often repeated, and always with the same results. It proves, I think, that ouabaïn is a powerful muscle poison, paralyzes sensation, and perhaps later the nerves.

I regret not having had opportunity to make myographic studies in the investigation of this drug, for at times the dying muscle would give a sudden sharp contraction, and then immediately relax, although the stimulus was continued, or, again, it would respond so sluggishly that it almost seemed as if it were not going to respond at all.

I had yet to prove that the nerves were paralyzed. To accomplish this, I carefully dissected out the sciatic nerves and gastrocnemii muscles of both legs of a frog; then preparing a solution of ouabaïn and placing some of it in a watch-glass, I placed the nerve of one preparation (*A*) and the muscle of the other (*B*) in the liquid, and allowed the attached part to rest outside. The notes of the experiment read as follows:

10.14 Nerves and muscles of both preparations respond to the weakest current.

10.25 (Weak current.) *A*. Stimulation of the nerve fails to cause contraction in the muscle; the muscle responds readily. *B*. Muscle responds feebly and sluggishly when stimulated (current probably deflected by the moisture), but vigorously when the nerve is stimulated.

10.34 (Strong current.) *A*. Stimulation of the nerve causes contraction in the muscle, about equal to the contraction produced by direct stimulation of the muscle. *B*. Muscle responds less vigorously when stimulated than when the nerve is stimulated.

10.50 (Strongest current.) *A*. Nerve is seemingly paralyzed, and does not transmit stimuli, excepting a small portion next the muscle that was out of the solution; the muscle responds vigorously and promptly. *B*. The muscle responds feebly and sluggishly, and no better when the stimulus is applied to the nerve.

11.05 (Strongest current.) *A*. Nerve completely paralyzed; muscle unimpaired. *B*. Muscle completely paralyzed; stimulation of the nerve does not affect it.

It is clear, then, that when exposed to a strong solution of ouabaïn, the nerve becomes completely paralyzed, and that the muscle becomes far more rapidly paralyzed than if it were exposed to the atmosphere. To summarize the action of ouabaïn upon the neuro-muscular system, it may be said,—

1. That it diminishes and finally abolishes reflex action by paralysis of the peripheral sensory nerves, and this paralysis then extends to the sensory nerve-trunk.

2. That it paralyzes the striated muscles by direct action upon their tissue.

3. That it paralyzes the motor nerves only when the action in the body is very prolonged or when a strong solution is applied directly to the nerve.

4. There does not appear to be any action upon the central nervous system.

In a communication published in the *Comptes-Rendus de la Société de la Biologie* in 1889, M. Gley calls attention to the remarkable local anæsthetic action of strophanthin and ouabaïn. "Four drops," he states, "of a solution of 1 to 1000 of either of these substances, instilled into the eye of a guinea-pig, suffice to produce at the end of five minutes a very marked diminution of corneal sensibility. After three or four minutes more the anæsthesia is nearly complete; one can touch and prick the cornea without causing a reflex. This anæsthesia may last several hours (two or three); it diminishes in course of time, but during more than one hour and a half it remains almost absolute.

"Moreover, at no time was there the least inflammation; the eye did not appear at all irritated; the state of the little vessels remained the same." He adds that, in the case of one dog, there were signs of pain without inflammation. Further, that the anæsthesia is accompanied by a marked myosis which

commences in half an hour, and later brings the pupil to a pin-point. In a second communication he adds to this that there was noticed a notable augmentation of the volume of the eyeball and increase of intraocular tension.

Desiring to experiment upon this point, I had prepared an alcoholic solution of ouabaïn of such strength that one drop equalled .001 gramme. This worked very well at the first experiment, but for some reason failed to produce any effect afterwards. As a result, I have but one experiment to record. In performing this I was fortunate in having the assistance of Dr. C. A. Oliver, who determined points that I should not have been able to observe.

The animal used was a rabbit. The record is as follows:

Pupil, O. D., 5 × 6, long axis vertical.
O. S., 6 × 7, long axis vertical.
Tubercular choroiditis more marked in O. D.; O² corneal reflexes good.
8.45 Three drops of a solution 1 to 1000 in O. S.
8.52 Pupil dilated to seven millimetres; epithelium of cornea thickened.
8.54 Cornea much less sensitive; reflex occurs only after prolonged pressure with the cotton point.
8.58 Cornea, O. D., extremely sensitive.
9.00 O. S., pupil in strong light, 6 × 7; O² tension equal (normal).
9.05 Retinal arteries and veins as before instillation; media clear.
9.10 Three drops in O. S.
9.14 Cornea completely anæsthetic; tension normal; pupil, 7 × 8; responds to light.
9.20 Pupil comes down to 5 × 6 in strong light; cornea hazy and punctiform; corneal epithelium clearer.
9.24 Pupil, O. D., comes down to 5 × 6 in bright light; cornea, O. S., still anæsthetic; experiment abandoned.

The following morning the pupil in O. S. was found to be 6 × 7; the corneal reflex was good; conjunctiva not injected; O² tension normal. It follows from this that ouabaïn in very dilute solution will produce corneal anæsthesia. No definite action was manifested on the pupil or intraocular tension. But a single experiment is not conclusive, and, owing to some change in the solution, four others that I performed were failures. Drs. Hare and De Schweinitz have experimented with strophanthin, and found that, although it produces complete corneal anæsthesia in dogs, it produces intense inflammation in the human eye. In view of this, it is obvious that in experimenting on the human eye with ouabaïn the most minute doses should be at first employed. I know of no reason, either histological or physiological, that would account for this great difference in the results obtained upon men and the lower animals.

A few points concerning the general action of the drug remain to be noticed. It is a powerful emetic, and acts as such when injected subcutaneously. This action it shares, I believe, with the majority of muscle depressants. It promotes defecation, perhaps, by increasing peristalsis. It is a diuretic; at least it seems always to cause urination in the animals to which it is administered. I can think of no reason, unless it be increased blood-pressure or paralysis of the sphincter. Lastly, it does not appear to affect body temperature.

This completes the account of my experiments with ouabaïn. Whether the drug will ever be of practical value, time alone can determine. Abroad it has already been employed with asserted good results in pertussis in doses ranging from $\frac{1}{1000}$ to $\frac{1}{500}$ of a grain. It would seem that very minute doses might have the same action as digitalis; but its greatest value will probably be found to exist in its power as a local anæsthetic, which is certainly superior to that of cocaine. For the present, we must be content to know that it is extremely poisonous.

A NEW VERMIFUGE.

Attention has recently been directed by MR. HECKEL to a Scitamineous plant, which he has named *Ceratanthera Beaumetzi*, and which, under the names of "dadigogo" and "balancofouna," is employed on the west coast of Africa as a tænifuge and purgative (*Bulletin Général de Thérapeutique*, October 15, p. 336). The part used is the fresh rhizome, from which M. Schlagdenhauffen has separated a resinous substance, soluble in ether and petroleum, and an essential oil. The resinous extract, administered in doses of 1.20 grammes, acted only as a purge. On the other hand, 20 drops of the essential oil, given in a gelatin capsule, followed by a dose of castor oil, caused the complete expulsion of the tænia. This result is supposed to explain a previous want of success by Dr. Beaumetz, when using the rhizome in a dried condition.—*Pharmaceutical Journal and Transactions*, October 31, 1891.

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Leading Articles.

HYGIENIC AND CURATIVE TREATMENT OF NON-DIPHTHERITIC ANGINA.

ANDRÉ MARTIN has published in the *Bulletins et Memoires de la Société de Médecine Pratique* a paper on the above subject, in which he counsels greater antiseptic precautions in the treatment of those affections of the throat designated as simple or catarrhal, erythematous, and tonsillar angina, the origin of which has been referred in the past to atmospheric conditions, cold, humidity, etc. He regards simple acute angina, whether occurring idiopathically or in connection with influenza, measles, scarlet fever, or even typhoid fever, as essentially of infectious nature. It cannot be too much borne in mind that cosmical conditions are impotent of themselves—without bacterial influence—to produce catarrhal affections, and that cold and heat act principally by diminishing that phagocytosis which opposes to the penetration of germs an insurmountable barrier. When this barrier is broken, the field is clear, and the bacteria, which were vegetating, inoffensive, in the saliva, enter the circulation to localize themselves, according to the individual predisposition, in the pharynx, the lungs, or the pleura.

These considerations, Dr. Martin says, have led him the past two years to adopt a different kind of treatment from that which he had formally employed. In all the acute diseases of the pharynx and tonsils, he has abandoned the old methods—emetics, gargles, emollients, and astringents—for the antiseptic agents; and even acute coryza, which is often, as in measles and influenza, the manifestation of infectious disease, yields more rapidly to boracic lavages and irrigations than to narcotic and astringent decoctions and to aconite.

Dr. Martin's treatment of these acute catarrhal affections of the throat consists in painting the diseased surfaces three times a day with a phenic acid mixture constituted as follows:

℞ Crystallized phenic acid,
Camphor, āā 1 gramme;
Glycerin,
Distilled water, āā 50 grammes. M.

The first day, and even the first application, are marked by a notable amendment: deglutition of saliva and alimentary liquids is less painful; there is suppression of the nocturnal agitation and partial return of sleep. The next day, deglutition is still easier, the sleep good, and temperature nearly normal. The third day, notwithstanding the hypertrophy of the tonsils, which may last some time, the deglutition of solid substances is effected without difficulty; the fever is gone; there remains only a general enfeeblement, but the patient may be able in part to resume his occupation.

The dysphagia which accompanies the acute anginæ, simple or diphtheritic, is sometimes so great that it calls for the employment of nervine agents. The salicylate of sodium, and especially antipyrin, acetanilide, phenacetin, and exalgine, topical applications of cocaine (1 to 20), at meal-time, are precious auxiliaries. Patients who obstinately refuse to allow their throats to be painted with the phenic acid mixture should be required to submit to boracic acid irrigations, two litres per day of a warm four-per-cent. solution. The phenic camphor topical agent (which is a one-per-cent. solution) causes at first a momentary smarting of the diseased surfaces; this is soon followed by an anæsthetic action, with immediate improvement

in the dysphagia; and, as a general rule, the other analgesics may be dispensed with.

It is in simple erythematous angina (as might be expected) that this treatment has been most efficacious. The average duration of treatment in the mild form has been two and a half days, though naturally considerably longer in simple and pultaceous amygdalitis, while in amygdalitis, complicated with bronchitis, the affection may last a week or more.

In no case, Dr. Martin says, has he had sphacelus, suppuration, or adeno-phlegmon. Paintings with tincture of iodine, which he reserves for chronic cases, are considered by Burlureaux as the specific—at once curative and prophylactic—of phlegmonous angina. Dr. Martin has not tried iodine applications in acute cases, but he does not think them superior to phenic camphor. Moreover, it little matters what is the antiseptic employed; the principle which should always be kept in mind is that simple angina, even in its mildest form, represents an infectious state, and ought as such to receive a treatment not only expectant and antiphlogistic, but active and antiseptic.

Dr. Martin insists on the importance of prophylactic measures almost as rigorous as are indicated in diphtheria. The patient must not be allowed to expectorate on the floor, but in a spittoon, which must be thoroughly sterilized in boiling water several times a day. All swabs (which, for convenience, are made of absorbent cotton wound around a stick) are to be burned after being once used. Children and others, when the first symptoms appear, should be subjected to rigorous isolation.

These views and the resulting therapeutics are not altogether new; they are quite in keeping with the bacterial pathology of the present day, which sees in every catarrhal inflammation an infectious process. On referring to the first article in this number of the THERAPEUTIC GAZETEE, it will be seen that the savant lecturer of Cochin Hospital expresses the belief that no inflammation can originate apart from bacteria. This notion, too, is coming to be very generally held; whether future researches shall tend to confirm it or overthrow it, and whether or not the medical leaders of the day are carrying the microbe element of causation too far,—making of the microbe a kind of fetich, as some of the more conservative members of the profession think,—time will tell.

As for the treatment of the non-diphtheritic throat affections, there is, doubtless, a tendency everywhere to treat them antiseptically, and we doubt whether Dr. Martin's method, with all its parade (his paper has been published in several foreign medical journals), is a whit superior to the sprays of carbolic acid which every practitioner in this country uses. The sprays (which, with a hand-ball atomizer, may be made every two to four hours, a one- to five-per-cent. solution being used) are vastly more easy of application and are better tolerated by nervous patients than the swabbings, and the latter generally require a physician for their proper execution.

THE TREATMENT OF APPENDICITIS AND PERITYPHLITIS.

THERE is not yet a general consent to abandon the terms typhlitis and perityphlitis, denotive of inflammations in and around the cæcum, for the more modern term appendicitis, although it is true that, since the operative treatment of perityphlitis has come into vogue, surgeons who have sought for the starting-point of the inflammation have generally found it in the appendix. There certainly are pericæcal inflammations that end in resolution,—thirty per cent. of all the cases, according to Fitz,—and the presumption is that such inflammations are not suppurative, and due to perforative appendicitis. Professor Sonnenberg, of Berlin, who states this point very forcibly, has a large following, especially among the more conservative portion of the medical profession. There is a perityphlitis with sero-fibrinous exudation, presumably due to fæcal obstruction in the cæcum; these exudations are generally encapsulated, and are not apt to be followed by general peritonitis. All physicians of much experience have seen such cases. There is a large, firm, hard swelling at the beginning, which presents a marked contrast with the small exudations, circumscribed at the beginning, situated just above Poupart's ligament, which result from appendicitis. It is, of course, very important to differentiate clinically between the simple inflammatory and the purulent forms of perityphlitis, for the latter demand surgical intervention, and generally the sooner the better after the diagnosis has been made. The sero-fibrinous exudations are reabsorbed, purulent exudations originating in the appendix cannot be absorbed. In these lat-

ter cases (and here we follow Professor Sonnenberg's description) the disease has been preceded, at greater or less intervals, by attacks of colicky pains in the ileo-cæcal region. The exudation (which is circumscribed and small at the beginning) is the result of gangrene and perforation of the appendix, and is of a decidedly purulent or sero-purulent character.

Doubtless no subject more interests surgeons of the present day than that of the treatment of perityphlitic inflammations, and we need cite only the excellent work done in elucidation of the pathology and treatment of appendicitis and perityphlitis by Fitz, Homans, Bull, Elliot, McBurney, Weir, Keen, Stimson, Warren, and others in this country; by Mahomed, Treves, Dyce Duckworth, Bland Sutton, etc., in England; by Kraft, Matterstock, Maurin, Roux, Talamon, Tuffier, and many more on the continent of Europe. Among the great medical societies which have discussed the subject in all its bearings the present year, we may mention the Medical Society of the State of New York, the Massachusetts Medical Society, and the Clinical Society of London.

We cannot presume in this short article to do more than summarize some of the leading points in this mass of medical literature:

1. The mortality of the disease is great, fully fifty per cent. of those treated without surgical operation, according to Fitz.

2. In relatively mild cases, an expectant treatment only is justifiable. In the severe cases, the difficulty must always be to decide when medical treatment shall end and when surgical treatment shall begin. The more cautious men in our profession (physicians and surgeons) are, we are certain, in sympathy with the views expressed by Dr. Fitz at the Massachusetts Medical Society in June, to wait till the development of the symptoms is such as to indicate that there is either a spreading peritonitis, or such a circumscribing of the peritonitis as to make it probable that the operation will be successful. We think that it was Dr. McBurney who said at the meeting of the Medical Society of the State of New York, in February, that he had never known a patient on whom he had operated for appendicitis to recover if the peritonitis had become general. Therefore it is desirable to have some certainty that the peritonitis is really circumscribed. And when once the attending physician has made up his mind that the disease is no longer local, then he feels the impotence of drugs or other purely medical means to stay its advancing progress.

If by the tympanitic distention and tenderness in the upper part of the abdomen and on the left side (as well as on the right), by the dark-green vomitus, the increasing fever, hiccough, the anxious, pinched expression of the countenance, etc., there is reason to believe that the inflammation has overleaped the barrier of lymph whereby nature has walled in the exudation, the probability is that the barrier is already burst, and there is pus in the general abdominal cavity. Most physicians, with Fitz, would wait at least three days after the onset of the symptoms to watch the progress of the case, for the purpose of deciding whether it will recover under medical treatment or whether it will demand surgical treatment. This waiting is not only suggested by the experience in acute cases, but it is confirmed by those cases of chronic appendicitis where, after weeks of waiting, an abscess points in some region accessible to the surgical lancet, or into some internal viscus, as the colon, rectum, bladder, vagina.

On the other hand, many surgeons, like Dr. Alfred Worcester, at the Massachusetts Medical Society meeting, confident of their ability to treat these cases safely, according to the methods of modern antisepsis, and disposed from large experience to regard a laparotomy as a not necessarily hazardous operation, urge promptness in operating. Better by far operate too early rather than too late. Appendicitis, these gentlemen say, is from the first a surgical disease. They point to one great advantage in the early operation, and that is that it is easier to diagnosticate the disease in the first twenty-four hours than at any subsequent time. All the symptoms are more apparent at first. After the belly is swollen out, no man can diagnosticate the case except by abdominal section. They point to the fact that early operations are very generally successful, for reasons that are sufficiently obvious, and that in such cases the physician is not compelled to sign the death certificate of his patient as peritonitis; the patient gets well.

Dr. Worcester triumphantly refers to a record of cases operated on in the first twenty-four hours, where it was found, in some of them, that the appendix was gangrenous from the outset, and where the patients got well after a very short convalescence.

Dr. Elliot, at the same meeting, urged that perforating appendicitis was like a bullet-

wound in the intestines, and said that he nearly agreed with Dr. Worcester as to the desirability of a very early operation; but felt that the physician should be perfectly sure that his case was not one that would get well under expectancy, opiates, etc. All symptoms which indicate that a local process has begun in the region of the appendix are to be seriously considered, and almost always are a sufficient reason for operation. He would always operate in presence of a tumor; he would always operate in the presence of general distention and tympanites; he would always operate in presence of continued pain. Any violent constitutional symptoms should certainly be acted on, though constitutional symptoms are not so valuable as local symptoms.

With regard to the medical treatment of perityphlitis, there is general agreement that opiates should be given to the extent of relieving the pain, but there is not the same agreement as to the administration of cathartics. Some, as Lawson Tait, say that cathartics are the thing, and many good practitioners in this country act on the principle that the bowels should be kept open all through the disease, and for this purpose they choose castor oil (when it can be borne), and especially saline laxatives (Seidlitz powders, Epsom or Glauber salts, etc.); the results of the saline cathartic treatment certainly seem to be excellent. On the other hand, many good authorities counsel a very sparing administration of even saline laxatives, on the ground that by exciting movements of the bowels, the adhesive inflammation around the appendix and cæcum is interfered with and the protective lymph barrier broken up.

We believe that the majority of physicians, in treating this disease medically, have found that, along with a rigid opiate treatment, a moderate and judicious exhibition of mild saline laxatives (with or without purgative enemata) does not interfere with the formation of protective adhesions, and by unloading the distended bowels does good.

THE ACTION OF BROMIDE OF STRONTIUM.

IN the GAZETTE for February 16, 1891, we published an account of the continuation of Dr. Laborde's studies as to the effect of strontium and its salts on the animal organism. The most marked result determined in these experiments, which were made on dogs, was not only its entire innocuousness, but the marked diuretic action which followed the administration of the lactate or tartrate. Since then these salts have been subjected to further clinical studies, especially by Drs. Germain Sée and Féré. Dr. Sée reported his results before the meeting of the Académie de Médecine, which was held October 27, 1891 (*La Médecine Moderne*, October 29, 1891). While Dr. Sée was unable to confirm the statement of Laborde as to the diuretic properties of strontium salts, he, however, on the other hand, confirmed this author's statement as to its stimulating powers on the digestive functions. He found that the gastric disturbances common to various cardiac and renal affections were markedly improved by the administration of these salts, when given in doses of from ½ to 1 drachm, taken in divided doses in solution at meal-times. As he found that the bromide of strontium was the most soluble salt, he employed that preparation in his studies, in preference to the lactate, in thirty-two cases of dyspepsia, either with or without gastric dilatation, and in all there was marked improvement, especially as regards the evolution of gas, the strontium appearing especially to prevent acetic and lactic acid fermentations.

In six cases of nervous vomiting, no amelioration was noticed, although cannabis indica produced satisfactory results in these cases.

In dyspnœa its action appeared negative; while, on the other hand, in cases of Bright's disease it gave satisfactory results.

Dr. Sée called attention to the value of the bromide of strontium as a substitute for the potassium or sodium bromides, adding, further, that the action of the bromide of calcium is quite comparable to that of the bromide of strontium.

Dr. Charles Féré, in his studies of the bromide of strontium, paid especial attention to its action in epilepsy, his results being announced at the meeting of the Société de Biologie, held October 17, 1891 (*La Médecine Moderne*, October 22, 1891), and the meeting held October 24, 1891 (*La Tribune Médicale*, October 29, 1891).

Dr. Féré confirms the statements of Sée as to the good effects of the bromide of strontium in gastric cases, and asserts that when it is necessary to administer bromide to a patient with gastric irritability, the bromide of strontium should be preferred to all other bromides.

Dr. Féré maintains that the bromide of strontium, in its action in epilepsy, is quite

comparable to that of the bromide of potassium, even although it contains less bromine than the latter.

In reference to the statement that continuous administration of bromides predisposes to tuberculosis, he found that such statements could be confirmed in the case of the guinea-pig, where previous administration of the bromide caused those animals to succumb much sooner after inoculation with tubercle cultures than animals similarly inoculated, but in whom bromides had not been previously given.

Dr. Féré, however, states that he has never been able to note the development of phthisis in epileptics subjected to prolonged bromide treatment, but that such individuals seemed especially liable to attacks of pneumonia.

Another fact determined by Dr. Féré is that the bromides accumulate in the liver after prolonged administration, even to a greater degree than in the brain.

In his experience also bromide of strontium is a valuable substitute for the bromide of potassium in the treatment of epilepsy.

"TWENTY PENNYWORTH OF SACK AND ONLY ONE PENNYWORTH OF BREAD."

SUCH or similar language, once uttered by one of Shakespeare's characters *à propos* of the drunken Falstaff, might be the comments which some junior practitioner, sorely perplexed by difficult typhoid fever cases in private practice and anxiously looking for light, might make of a recent text-book on "Practice,"* which, too much in the continental style, devotes a hundred pages to the bacteriology, pathology, symptomatology, etc., of typhoid fever, and dismisses the "treatment" by a few general considerations relative to cold baths and other antipyretic agents.

If said "junior practitioner" were desirous of carrying out the Brand system, he would, doubtless, find useful hints under the "*technique du traitement;*" he would glean little else that would be useful to him under the head of "Therapeutics." Nothing is said about the antiseptic method as taught by Professor Bouchard, and for which such brilliant results are claimed; and, as for the "accidents" or complications of the disease, such as diarrhœa, meteorism, intestinal hemorrhage, the reader is left quite in the dark as to the best method of meeting them. In this respect this treatise presents a marked contrast to the treatises of Corre and Gueneau-de-Mussy, Liebermeister, Murchison, Graves, Stokes, Hudson, J. C. Wilson, and many others that we might mention. In this French treatise we have looked in vain for any clear indications as to the administration of stimulants, and the subject of dietetics is hardly touched upon.

We think that this is a mistake in a work intended to represent the latest and most advanced science, and to furnish the practitioner all needful help in his work. Therapeutics, being the real end and aim of medical teaching, ought not to be relegated to an inferior and subordinate rank in a work intended to meet the necessities of the age; and we may say, once for all, that the curt and incomplete manner in which many of these continental authorities treat therapeutics has long been the reproach of continental medicine.

The book to which we refer is undoubtedly one of great promise, and too much cannot be said in praise of the general execution of that part which has appeared; it is, also, too true (as the writers say in their preface) "that pathology is being well-nigh revolutionized every twenty years, and that during even a less space of time a renaissance of surprising richness has transformed not only the methods but the matter even of medical teaching." Nothing, moreover, could excel in general completeness the masterly exposition of typhoid fever from the pen of Professor Chantemesse. Typhoid fever is defined as "a general disease, which expresses the reaction of the organism when invaded by the bacillus typhosus." We do not know where else can be found so full an account of the Eberth bacillus and the toxic substances which it elaborates; the results of inoculations; the relationship of this bacillus to soils, to sewerage, to drinking-waters, etc.; the modes in which it obtains access to the human body; the causes which favor its invasion; its conduct on the economy. The subject of "Pathological Anatomy" is exhaustively handled, and it would be difficult to exceed the description of symptoms; and we say again, what we have said before, that it is a pity that the subject of treatment had not been deemed of equal importance and received equal attention.

We cannot forbear advising the authors of

* "Traité de Médecine," published under the direction of Charcot, Bouchard, and Brissand, Vol. I. Paris, G. Masson, 1891. (Work to be completed in five volumes in 1893.)

this new treatise, who are writing under the auspices of such distinguished leaders, not to neglect the subject of therapeutics in future volumes,—there are four more to come; for without an adequate presentation of the treatment, these huge tomes will be by the busy practitioner, who cannot find time for anything but practical details, relegated to the department of rubbish, or kept simply for ornamental display in some little-frequented corner of his library, till twenty years come around, when, presumably, there will be another revolutionary crisis in medicine.

Reports on Therapeutic Progress.

ENDOMETRITIS.

According to the Paris correspondent of the *Lancet* (October 31, 1891) the following is the treatment of this troublesome complaint pursued by Dr. Labadie-Lagrave at the Paris Maternity Hospital. Starting from the idea that endometritis is most frequently of infectious origin (puerperal or gonorrhœal), he very logically applies to its cure the same therapeutic measures found appropriate in combating lymphangeitic processes occurring in any other part of the body. A person pricks his finger, lymphangeitis supervenes, with swelling of the epitrochlear and axillary glands. The local treatment found most efficacious here is free incision, with prolonged antiseptic baths. In like manner, endometritis should be met by dilatation of the os and subsequent assiduous disinfection of the cavity of the organ. The *modus operandi* of Dr. Labadie-Lagrave is as follows: The vagina is first rendered thoroughly aseptic by means of frequent douches with a 1 in 5000 sublimate solution continued for two or three days. The os is then dilated with laminaria tents, carefully asepticized. The introduction of each tent is followed by a vaginal douche and plugging of the vagina with iodoform gauze, or cotton-wool soaked in a sublimate solution. Dilatation being complete, the uterine cavity is, after having been previousiy washed out, tamponned with iodoform gauze soaked in a one-third glycerin solution of creosote. In introducing the strips of gauze, each of which should be forty centimetres long by two broad, undue downward traction on the os should be carefully avoided, as such traction might easily light up fresh inflammatory mischief. The intra-uterine dressing is renewed, at first daily, then every other day, for a period of two or three weeks, the patient being meanwhile restricted to the recumbent posture. In this way recovery is readily procured in fairly recent cases. For the efficacious treatment of chronic villous endometritis, scraping of the altered mucosa will be necessary previously to the application of the method described above.

THE TREATMENT OF CHRONIC INTESTINAL CATARRH IN CHILDREN.

1. Sixteen children, with an average age of 8 months, suffering with chronic catarrh, and already in an atrophic condition, had an average weight of three thousand four hundred and twenty-three grammes each on the day of their reception into the hospital, in which they came under the author's observation.

2. They were kept in the hospital for varying periods of time, but the average was eighty-one days, and the average gain in weight during that period was one thousand nine hundred and twenty-five grammes.

3. The daily increase in weight was from ten to fifty six grammes; it averaged twenty-nine grammes.

4. We should never despair of the recovery of children suffering with chronic intestinal catarrh, no matter how far advanced the atrophic process is.

The treatment of this disease should be principally dietetic, but medicaments will serve as adjuncts. In children who are only a few months old and nursed exclusively at the breast of a mother or nurse, chronic intestinal catarrh will be due either to irregular and frequent nursing, or to the fact that the character of the milk is unsuited to the age of the child, or is rendered unsuitable by a recurrent menstruation, a pregnancy, or some chronic disease of the mother or nurse.

Should the intestinal disturbance be due to irregular and frequent nursing, of course, the latter must be properly regulated. If the cause lies in the milk furnished by the mother or nurse, then another nurse must be procured; not to do it would jeopardize the child's life. If the child is fed from the bottle, the physician must see that the bottle is properly cared for. If a nursing child is being also fed with rice or wheaten flour-gruel, or other substances of a similar character, they must all be removed from its diet. If the child must have something in addition to the supply from the breast, cows' or goats'

milk may be given three or four times daily in the intervals of nursing, and about three or four ounces at a time with a little sugar and lime-water mixed with it. If the evacuations are slimy or yellow and have no clots of casein, or only very small ones, bismuth may be given in 25 centigramme doses four times daily. If the stools are green and contain numerous lumps of casein, and are, moreover, accompanied by severe abdominal pain, bismuth and lime-water with a little fennel-water may be given. Or, if the trouble persists, the infusion of colombo root may be added to the bismuth, thus,—

℞ Infusi radicis colombo, 75 grammes;
Bismuthi subnitr., 3 grammes;
Syr. auran. flo., 15 grammes.
Sig.—Two coffeespoonfuls every two hours.

For children one or two years old, who have been weaned too early and have been fed on substances illy adapted to their condition, the following is suggested:

If the child is having only five or six movements in twenty-four hours, is pale, his muscles flabby, has little or no fever and considerable vitality, he may be fed with gruel made from cows' milk and pulverized rice or arrow-root. It may be given every three hours. During the night he may have a drink of cows' milk with lime-water twice. This diet must be kept up for a month. Also before each meal and at bedtime a powder should be given containing a grain or a grain and a half of quinine and two and a half grains of bismuth. If the trouble does not yield, one may add one or two coffeespoonfuls of syrup of colombo four times daily, or an infusion of the root with bismuth, as in the foregoing formula.

If, however, the diarrhœa is very severe and of long standing, the movements numbering twelve or more per day, atrophy being pronounced and fever and thirst constant; if, moreover, the child cries all the time and emaciation is rapidly advancing, only one thing can be done, and that is to use an exclusive diet of milk. The following is recommended: During the first two days two dessertspoonfuls of clear warm milk must be given every two hours. From the third day three spoonfuls must be given at the same intervals. After four days the milk may be given at longer intervals and in larger quantities. This diet must be continued three or four weeks, when the gruels may be given, this diet continuing until the intestinal catarrh is cured. If the milk diet is not satisfactory, asses' milk must be procured, and if this fails, a wet-nurse must be provided, even though the child has long been weaned. This proposition involves great difficulties, but has often been the means of saving life. In some cases in which recovery has almost taken place, it may be safe to vary the milk diet with broth from boiled or stewed meat, which may be given in dessertspoonful doses four times daily. Or one may give small portions of raw meat, in balls as large as a hazel-nut, three being given every three hours for several days. In addition to the foregoing, it is sometimes advisable to use gold, as in the following formula:

℞ Auri, .20 gramme;
Mellis, 125 grammes.
Sig.—One coffeespoonful in the morning and two in the afternoon.

Other drugs have been used, but little benefit has been derived from them. Much benefit *has* been derived, however, from the use of aromatic baths, sulphur baths, baths impregnated with chestnut leaves, and plenty of fresh country air.—*Arch. f. Kinderh.*, xiii. 1 and 2; *Archives of Pediatrics*, November, 1891.

THE TREATMENT OF DYSENTERY.

At the meeting of the Medical Society of London, held October 19, 1891 (*Lancet*, October 24, 1891), PROFESSOR BAHADHUDJI (of Bombay) read a paper on the "Treatment of Dysentery." Referring first to its pathological anatomy, he said that the large intestine would present one or more of the following conditions: 1, areas of congestion in cæcum and bends of colon; 2, simple transverse abrasions at the lower end of the bowel; 3, simple general catarrh, with thickened glands; 4, mucous and submucous infiltration of a necrotic character, with general thickening of the bowel; 5, areas of diffused submucous infiltration, leading to gangrene of the mucous lining; and, 6, fulness of the portal vessels. In some very chronic cases there was a very general thinning of the gut, the colon showing marked atrophy. He compared the pathological changes in the large bowel to the catarrhal abrasions, the infiltrations and ulcerations of the mucous lining of the mouth and pharynx. In the mouth the initial irritation gave rise to a flow of saliva, and there would be a feeling of soreness about the mouth and throat. Then followed swelling, the salivary flow became less watery, there was a nasty taste in the mouth, and the

breath smelt foul. Movements of the tongue and mouth became painful, and warm drinks and spirits were not agreeable. Dirty, sticky phlegm hung to the back of the throat, and it might show streaks of blood. In dysentery the initial irritation in the large intestine led to an increased watery flow of the secretion of the alimentary canal, and, reflexly, of the liver. There was diarrhœa, which was often of biliary nature. Then the stools grew less watery, contained slime, and were fœtid. The slime came away with difficulty, causing tenesmus, and was later mixed with blood, which was greater in the case of the bowel owing to the more copious vascular supply. There was a general soreness of the abdomen, more particularly at the cæcum and at the flexures of the colon. The stools became shreddy in cases of ulcers discharging sloughs, and were offensively fœtid if there were any gangrenous destruction of the mucous membrane. As Professor Bahadhudji compared the pathology of these two affections, so he recommended that the treatment should be similar. All irritants, direct or indirect, should be avoided, such as stimulant foods and drinks, particularly meat and its extracts. He held that the indiscriminate use of meat extracts and meat juices in fever and inflammatory affections was irrational in principle and harmful in practice. It should be remembered that they were not nutritive but merely stimulant extractives, and it was the custom to give them to invalids in far too large quantities. Milk by itself, he held, was irritating; it clotted readily, and acted as a foreign body. He said that arrow-root mixed with milk was the best form of diet; it acted almost as a protective to the mucous lining. Brandy, ether, ammonia, and the like were contraindicated. The mucous lining should be helped to get rid of the mucus clinging to it, and alkalies given internally would not only loosen the mucus but check its secretion. Means should be taken to combat putrefactive decomposition by the administration of bismuth subnitrate given in small quantity. Ipecacuanha in small doses would influence the intestinal glands themselves, and tend to check secretion of unhealthy mucus. The irritation brought about by intestinal movement should be prevented by opium, which would not only check irregular peristalsis but control secretion. Should there be much weeping of the alimentary mucous membrane, with copious watery stools, vegetable astringents were indicated, such as catechu in powder and preparations of bael and pomegranate. This simple treatment, which aimed at acting on the blood, the intestinal glands, and at keeping the intestinal canal and its contents sweet, so as to enable the ulcers to take on a healthy character and heal, consisted in giving a combination of bismuth, pulv. ipecac. co. and soda, with a dietary of arrow-root and milk. It was often a good plan to give an initial dose of calomel and soda to clear away any source of irritation that might still remain in the bowel. The purely astringent treatment did not meet all the requirements of the case, and hence was uncertain in its results, and the same might be said of other empirical methods. The invariable results observed both in private and hospital practice with the above simple treatment were that the patient was first relieved of the distention, griping, tenderness and tenesmus, the quantity of blood was decreased, the stools were less offensive, though for a day or two they remained unreduced in number. About the third day the slime became less, by the fourth the blood had disappeared, there was very little slime, the stools were feculent and not foul, and the patient began to feel hungry. By the fifth day the slime had disappeared, the stools were formed and not frequent. On the fourth or fifth day the patient was allowed some extra milk and bread also, if it did not disagree. Ordinary diet was withheld for at least a week longer. Blood was generally the first sign to reappear if ordinary diet was allowed too early. He attributed the extreme prostration of the disease to reflex nervous depression, and in chronic cases to impairment of the absorption apparatus, and to the deleterious effect of the presence of decomposing gases in the alimentary canal, which gained easy access to the circulation through the open ulcers. Again, the decomposing fluids in the intestinal tract were absorbed, and might cause death from septic intoxication. Meat and its extracts, being readily decomposable, were thus particularly harmful. He did not regard dysentery as due to any specific cause or germ; it was neither contagious nor infectious. The beginning of the ulceration in dysentery arose in much the same general way as did the ulceration of the mouth or pharynx: a lowering of the system by unhealthy water and food. Malarial influences, and anything tending to an overfulness of the mesenteric veins, such as chills, a sudden change of climate, a sudden change of diet, great excess in eating, etc., would also bring it on. When whole groups of people became affected, and dysentery attacked individual

after individual, it was not because there was a specific cause, but because all those affected were exposed to the same general lowering conditions, such as privation or exhausting labor. It was a simple disease, with simple beginnings but grave endings. An ordinary wound was a simple matter, but it might cost the limb, if not the life, of an individual if putrefactive blood-poisoning were not avoided, or, if present, combated. The same obtained regarding the wounds in the alimentary canal; the irritant blood-poisoning which took place at the seat of the ulcers, and was helped in its lowering action by the loss of blood, might take the life of the patient, or, if it were less acute, it would leave him with impoverished blood and debilitated bowel.

THE TREATMENT OF ILEUS.

DR. AUFRECHT, of Magdeburg, discusses in the *Therapeutische Monatshefte* the treatment of ileus. He thinks the washing out of the stomach, recommended by Kussmaul, a valuable addition to our therapeutic resources. The first and more important indication for washing out the stomach is prominence of the organ itself when vomiting is not present or is suddenly arrested,—a circumstance which occurs in about a fifth of all the cases of ileus. He explains the sudden arrest or entire absence of vomiting, when the stomach is at the same time distended, by a slight dislocation, caused by the distended intestines, which forces the œsophagus against the margin of the foramen in the diaphragm, through which it passes. An introduction of the sound will give the best justification for such a view. The sound finds no impediment in the œsophagus, and immediately it reaches the stomach a surprisingly large quantity of liquid escapes. Dr. Aufrecht even contends that in some cases all symptoms improve by the mere introduction of the sound, and without washing out the organ. Another indication for washing out the stomach is stercoraceous vomiting. In such cases repeated washing out will remove the abnormal contents of the stomach and prevent them from doing further damage locally or by absorption. He also insists on the hypodermic administration of morphine in all cases of ileus. This treatment keeps the patient almost free from pain, which proves that peristaltic movements proceed quite normally. He is against all internal administration of opium or morphine, as their effect is not prompt when so administered, and because in the case of vomiting it is impossible to say how much of the drug has been retained. Dr. Aufrecht has also long since ceased to administer large enemata, which, in his opinion, could only be of any use during the first few days of the disease. He punctured the gut twice in the year 1873, with very unsatisfactory results: the punctured coil collapsed, but no considerable evacuation of gases took place, and one of the two succumbed from peritonitis, which appeared to have been produced by the puncture.—*Lancet*, October 24, 1891.

FREE USE OF COCAINE IN HAY-FEVER.

In the *New York Medical Journal* for October 31, 1891, DR. J. W. STICKLER cautions against the free use of cocaine in hay-fever for the following reasons:

"1. It may cause a very great, even dangerous, depression of the vital powers. Last summer a patient introduced quite a liberal quantity into his nostrils, and in a few moments he was in a condition of collapse. His physician was sent for, and, after working over him for a long time, had the pleasure of seeing him restored to a speaking condition. Subsequently a good deal of professional care was required to bring him up to anything like a normal state of health.

"2. If used freely it seriously impairs the appetite.

"3. If used late in the day or during the evening it is very apt to induce insomnia. Persons who have hay-fever do not long for any other physical disaster, at least not till they get rid of the sneezing.

"4. The free use of cocaine induces in many persons a free diaphoresis.

"5. The excessive use of cocaine often causes troublesome congestion of the nasal mucous membrane.

"6. This powerful drug prevents sneezing and allays irritation only when the membrane affected is under its anæsthetic influence, hence in bad cases it must be used almost constantly.

"7. Cocaine causes in some persons a very pleasant mental stimulation, which, while it lasts, is very delightful, but is invariably followed by mental depression and often by great irritability of temper.

"8. It often causes troublesome constipation.

"9. It does not *cure* hay-fever."

THE ENLARGED PROSTATE AND ITS OPERATIVE RELIEF.

At the meeting of the New York Academy of Medicine, held October 1, 1891 (*New York Medical Journal*, November 7, 1891), DR. E. L. KEYES read a paper on this subject. He said that to-day prostatotomy and prostatectomy were accomplished surgical facts and splendid additions to our resources in that class of grave vesical disorders found so often in the best ranks of the community late in life, in those who used their brains rather than their muscles and led sedentary lives. Yet the indications for these operations were not yet fixed. The questions on which the author asked for discussion were: 1. When was perineal prostatectomy to be preferred to the suprapubic operation? 2. What condition of prostate or vesical disease, or both, justified a radical operation, and should it be done early or late? 3. How much of the prostate should be taken away?

Prostatotomy as an adjuvant to vesical drainage had been so generally recognized as a proper concomitant of the latter operation that its consideration need not be dwelt upon, nor that new form of operation—lateral prostatectomy—performed by dissecting off the rectum from the prostate and peripherally slicing away its lateral lobes without opening either the urethra or the bladder. This operation had been suggested theoretically after cadaveric research by Dittle last year; but, aside from its manifest inability to cope with the median prostatic overgrowth, it had been tried and found wanting this year by Küster. The author then gave a detailed history of his cases, eleven in number,—three perineal and eight suprapubic. The results in the suprapubic cases had been two deaths,—one in a very promising case, the other in a very grave one. After the second case, all the remaining patients had taken diuretin freely and salol, and in none had there been any urinary fever, suppression, or pyelitis. Antiseptic irrigations and the usual precautions had been always followed. In age the patients had averaged 64. The cases had not been selected, except that all mild ones had been refused operation and no desperate case had been denied the chance, and out of these several of the patients had been so nearly dead when taken in hand that the operation had seemed more like the short horn of a dilemma than an operation of choice or expediency. Suprapubic prostatectomy in cases of this nature was of the first order in magnitude and gravity. In the author's opinion, it far outranked nephrotomy, or even nephrectomy, in gravity. Even in the milder or seemingly milder cases it was a grave resource, as every second operation demonstrated, and he thought it was not proper to attack cases early, when the symptoms were not severe, with an operation the best statistics of which yielded a mortality of 13.6 per cent., and where the well-known chances of life with the use of the catheter were so high. As to the power of restoring contractility to an atonied organ, the author's statistics lacked value on account of the recent date of several of his operations. In his eight suprapubic cases two patients had died; in three of the others, although all were up and about, the wound was not quite healed. Of the remaining three, in Case I. the operation was insufficient and the atony remained, although urination was natural and voluntary up to that point. Case II.: The patient had had eight ounces of residuum, and now emptied his bladder completely. Case III.: This patient had also entirely dispensed with the catheter and was functionally well. Whether the others would lose their atony and empty their bladders entirely without the catheter the author could not say at this time. Of the three perineal cases, two patients had emptied their bladders entirely after the operation.

An important lesson taught by the author's cases was the variety in texture of the enlarged prostate. In some instances he had found it so tough as to make it impossible of removal by the use of the curved scissors, and then digging out with the fingers. This had suggested the employment of the rongeur for this purpose, and he wished to emphasize the fact that he had found it invaluable. He then went minutely into the details of the operation as done by himself. He preferred the vertical to the transverse incision always, and in this operation, which resulted in so much hemorrhage, he thought open dressings should be used. His method was to use one or two buried sutures of catgut to attach the recti muscles, the yellow fat below the peritoneum, and the bladder wall above its incision into one firmly-knotted mass, then to carry one end of the silk loop on each side which had been supporting the bladder during the operation through the rectus muscle on either side, and again to knot it, and then tie the two loops together under considerable tension with a string passed across the sacrum. This would hold the loops between the pelvic crest and the great trochanter on

either side. This loop went in over the skin through the rectus, through the bladder, thence up over the skin on either side. The tension of the two kept the wound constantly open. Continued irrigation could then be maintained.

The author's conclusions were:

1. Prostatectomy is justifiable and does what nothing else can.

2. The perineal operation is less severe, but also decidedly less reliable, than the suprapubic; it should rarely be preferred unless there are urethral complications. In very feeble old men it may still be the operation of election.

3. The operation is not justifiable with the present statistics if the patient can be comfortable in catheter life.

4. No physical condition of the parts or of the patient short of a practically moribund state contraindicates an operation. By it in desperate cases life is often actually saved, although the operation is a grave one and its mortality high.

5. With the rongeur, better than with any other instrument, the bladder outlet can be lowered and polypoid or interstitial growths jutting into the prostatic sinus can be removed, and these points are more essential to a successful issue than the taking away of a large portion of the prostate bulk. The instrument next in value is the curved scissors; but the trained finger is the most important of all.

6. Diuretin is perhaps of value when the kidneys are deranged. It certainly does no harm.

7. Chloroform alone should be used as an anæsthetic.

THE NITRIC ACID METHOD OF DETECTING CARCINOMATOUS TISSUES.

In the course of a paper on carcinoma of the breast, read by Dr. F. S. Dennis before the American Surgical Association (*New York Medical Journal*, November 7, 1891), the author gave the details of a recently-devised method suggested by Harold J. Stiles, M.B., F.R.C.S.E., assistant to the Professor of Surgery in the University of Edinburgh. The steps of the process had been specially communicated to the author of the paper on carcinoma by Professor Cheyne, of Edinburgh, for embodiment in the paper and presentation to the Association of American Surgeons in congress at Washington. The process is given here from the manuscripts of Mr. Stiles:

1. Wash the mamma in water to remove all traces of blood. This is important, because after treatment with nitric acid the blood becomes blackened and difficult to remove, and therefore greatly obscures the appearances which the method brings out.

2. Submerge the whole organ in a five-per-cent. aqueous solution of *acidum nitricum* (B. P.) for about ten minutes,—that is to say, during the time the surgeon is clearing out the axilla.

3. Wash in plenty of running water for five minutes.

4. Place in methylated spirit (undiluted) for two or three minutes.

5. Examine the whole surface very carefully to ascertain (*a*) whether any part of the tumor is exposed upon the surface, or (*b*) whether any locally-disseminated cancer foci are exposed upon the cut surface, or (*c*) whether breast tissue is exposed.

The effect of the above-given method is to render all carcinomatous tissue and parenchyma dull and opaque white, due to coagulation of the albumen of the protoplasm of the cancer and epithelial cells. The fibrous tissue of the stroma is rendered gelatinous, translucent, and homogeneous in appearance and somewhat India-rubber-like in consistence. The fat is unaltered.

After examining the surface of the organ it should be cut into thick slices, and these are to be treated in the same way. Thus the various normal and pathological constituents of the mamma can be readily and most satisfactorily studied. Cancer and parenchyma can at once be detected if present upon the surgeon's cut surface, and, since the examination can easily be completed before the time for suturing the wound, we have in this method a means which affords the surgeon a valuable aid in ascertaining the limits of the disease and of the organ.

In two cases recently operated on by Professor Cheyne the writer was able to point out to him a speck of cancer no larger than a pin's head exposed upon the cut surface of the mamma. A corresponding point of the wound was searched, and in each case the remainder of the disease was discovered and removed.

The writer possesses microscopic preparations proving the cancerous nature of the portions so discovered. It is necessary to point out, however, that even although no locally-disseminated foci may be discovered

upon the surgeon's cut surface, the prognosis is not necessarily good, because, as we have already seen, the presence of lymphatics containing cancer cells cannot be detected with the naked eye.

In a microscopic investigation of tumors of the breast we have in the nitric acid method a means which enables us to select exactly those portions which are most likely to illustrate special points, and in this way much time and labor is saved. Those slices from which pieces are to be selected for microscopical examination must not be allowed to remain in the acid solution for more than a few minutes, as the acid renders the tissue too hard for section cutting.

PROFESSOR T. BRYANT, of England, in the course of the argument which followed the paper on carcinoma of the breast by Dr. Dennis, said that we must look upon that author's effort as a complete exposition of the whole subject. When dealing with the treatment of carcinoma of the atrophic character and comparing it with results of treatment of a more active type, it must be felt that we were considering two diseases whose histories did not differ in origin but in character. Clinically we must separate the two growths,—the slowly-growing scirrhous form and the more rapidly-growing tuberous form. He agreed entirely with Dr. Dennis as to the local origin of the cancerous tissues. There might be a predisposition for the development, but of what this consisted, whether hereditary or acquired, mattered little. It wanted no argument to prove that the successful treatment of cancer of the breast depended much upon the stage of the disease at which it was undertaken. Advanced carcinoma never could be treated with the same chance of a good result as when such treatment was begun at an early period. Then came the question of diagnosis. He wished that surgeons could always see these cases in their incipiency. A little induration in the breast was passed by and the family doctor was not consulted; then the operator nearly always had to deal with an advanced case. When the disease occurred during the active period of mammary life, the physician might be excused for assuming that the condition was one of local mastitis, but after functional activity had ceased it was safer to consider any trouble as cancer, and then it was only in the early stage that there was hope of doing good.

It was the speaker's custom, when a case of induration presented, to tell the patient that any incision would certainly cure the condition if it was not cancer, and that if it were such, operation was the one imperative procedure. He had treated upward of thirty cases of this kind, and in every one of these he had found the disease to be of a cancerous nature. In all the cases he had removed the breast, and in many he had extirpated the axillary glands. At present he had not had one case of recurrence.

Interference with the slowly-developing atrophic form of cancer simply seemed to light up the disease, and therefore it is better not to touch these true stony cancers in the aged.

TREATMENT OF HEADACHE OF GASTRIC ORIGIN.

DR. WESTPHALEN (*Berlin. Klin. Wochenschr.*, No. 37, 1891) discusses headache of gastric origin. He refers at the outset to two cases observed by him in conjunction with Dr. Moritz, and published by the latter. Although these patients did not suffer from headache, but were the subjects of obstinate intermittent fever, combined with skin eruptions resembling erythema nodosum, their cases are included in the present paper because Dr. Westphalen is of opinion that such symptoms are of gastric origin; that, in fact, toxic substances present in the stomach under certain circumstances are capable of producing, after absorption, various skin eruptions and disturbance of temperature on the one hand, and, on the other, disturbances of circulation in the central nervous system and its associated parts, a consequence of which is headache. In the two cases referred to, attention was drawn to the stomach by slight dyspeptic trouble. The conclusion having been come to that the general disturbance was due to absorption of toxic material from the stomach, an indication presented itself in the fact that, in one of the cases, there was complete absence of hydrochloric acid from the contents of the stomach. The acid was prescribed in both cases; the fever and skin eruption disappeared, and the patients completely recovered. The author explains the success of the drug on the theory that the ptomaïnes or toxines of micro-organisms are capable of exerting their detrimental influence only when there is a deficiency in the amount of free mineral acid in the stomach. The antiparasitic action of the normal gastric juice may be taken as proved in the case of certain species of bacteria at any rate. To the

two cases first reported three others are now added. In one the skin-affection present was erythema exudativum multiforme, in the other two urticaria. All were cured by hydrochloric acid. In one of the urticaria cases the outbreak was apparently prevented by this drug. The patient, who suffered regularly from urticaria, accompanied by giddiness and a feeling of congestion in the head after eating strawberries, was induced to eat a quantity of them, and to take 20 drops of dilute hydrochloric acid fifteen minutes afterwards. The symptoms failed to appear. The author next gives details of four cases of unilateral headache associated with dyspepsia and following upon errors of diet. The patients had taken many drugs, such as antipyrin, antifebrin, caffeine, phenacetin, without benefit; muriatic acid caused the headache rapidly to disappear. Further treatment consisted in the regular administration of the acid in association with mineral waters, and attention to the diet. Three of the patients recovered, while the fourth was materially benefited. In two of these cases, also, the headache was apparently prevented by the administration of the acid directly after the patient had eaten freely of some article the ingestion of which had hitherto been invariably followed by headache. While believing that in very many cases the symptoms (headache, skin eruptions, fever) may with much probability be referred to the action of some poisonous product of bacteria, Westphalen remarks that in certain cases the nature of the noxious substance is obscure, as, for example, in those in which the symptoms mentioned follow the ingestion of such articles as chocolate and strawberries. But in this last class of cases, also, muriatic acid is efficacious.—*British Medical Journal*, October 7, 1891.

CONVALLARIA MAJALIS AND CONVALLAMARIN IN THERAPEUTICS.

Dr. Manuel S. M. Bustamente has again drawn attention to the valuable therapeutic properties of convallaria majalis (*Siglo Medico*, October 4, 1891), and gives details of the successful employment of convallamarin (its active principle) in a number of cases of cardiac affections. The drug seems to be particularly of service in valvular lesions with increased venous and diminished arterial tension. The author utters a note of warning against the employment of cardiac tonics, convallamarin in particular, in cases in which the opposite conditions are present, and he describes an instance in which grave results—hæmoptysis, pulmonary embarrassment, etc.—followed from neglect of this precaution. Details are given of ten cases in which very beneficial effects resulted from the daily use of from eight to ten centigrammes of the drug. The following is a brief description of one of these cases: Patient, aged 44, with chronic pulmonary catarrh and all the symptoms of dilated heart,—increased cardiac dulness, very feeble impulse, but no murmurs. She had râles at both bases, considerable dyspnœa, and prominence of both jugulars; enlargement of the viscera, especially of the liver, with slight jaundice, and very diminished excretion of urine,—two hundred cubic centimetres in twenty-four hours. Convallamarin was given in a dose of 10 centigrammes on the first day, with the result that dyspnœa diminished, râles nearly disappeared, œdema was reduced, and urine increased in amount to one thousand cubic centimetres. Repeating the dose for eight days, a continuous improvement was noted, so that the patient could rest in comfort, the cardiac impulse became firm and regular, dulness became somewhat diminished, and cerebral symptoms (headache, semi-comatose condition), the effect probably of cerebral œdema, vanished. Urine rose in amount to eighteen hundred cubic centimetres daily. No ill effects whatever were noted. A similarly striking result is recorded in cases in which there was actual valvular lesion, with insufficiency and dilatation of the right side of the heart, venous engorgement, and general œdema, with diminished urine. The drug seemed superior in these cases even to digitalis or caffeine, the better known cardiac tonics, and sometimes gave relief when these failed.—*British Medical Journal*, October 31, 1891.

PHYSIOLOGICAL TREATMENT OF CERTAIN SKIN-AFFECTIONS.

According to the Paris correspondent of the *Lancet* (October 24, 1891), at a recent meeting of the Academy of Medicine, M. Dujardin-Beaumetz communicated certain observations of M. Semmola, of Naples, on what he termed the physiological treatment of some cutaneous affections. There exists, he pointed out, certain forms of eczema and psoriasis, which become manifest during the warm season, and disappear as soon as the cold sets in. These eruptions are determined by the irritant action of products eliminated by the skin. The general nutri-

tive exchanges being modified and the sudorific function being suppressed, the organism is, as it were, forced to rid itself of these products of incomplete oxidation by the cutaneous surface under a more concentrated form, and with a somewhat different chemical composition. In such cases it suffices to adopt a purely physiological method to bring about the cure of the eruption,—that is to say, it is necessary to re-establish the equilibrium between the activity of the organic exchanges and the depurative functions of the skin. With this object the patients are submitted to the prolonged action of baths of 30° to 35° C. during two to three hours from the commencement of September. After four weeks of this treatment, daily douches are substituted for the baths, and continued all the winter every other day. As an aid to the above treatment, M. Semmola prescribes, where there is any scrofulous taint, iodide of sodium in liberal doses, or, if there be any suspicion of gout or rheumatism, the bicarbonate and phosphate of sodium.

THE HYPODERMIC INJECTION OF CAMPHOR.

The employment of camphor hypodermically, in solution in oil, alcohol, or alcohol and ether, is much more general on the Continent than in England. German and Russian practitioners esteem it a valuable method of treating symptoms of impending collapse. Dr. Alexander, of Berlin, has published in the *Berliner Klinische Wochenschrift* a paper giving the results of an extensive series of observations made during the last two years on the effects of hypodermic injections of oleum camphoratum (composed of 1 part of camphor to 9 parts of olive oil) in a large number of cases of disease of the lungs. The dose given was 15 minims once a day. As the effects of camphor are cumulative, it was found that four daily injections were as much as could usually be borne without some unpleasant effects, such as headache and restlessness at night. After an interval of a week, however, one more injection could be given without causing any unpleasant symptoms. Phthisical patients seemed to bear continued treatment better than others, and its results in the last stage of phthisis were very valuable, the night-sweats, the irritating cough, and the expectoration being diminished in a remarkable manner, even the first dose effecting a very noticeable improvement in the patient's condition. In hæmoptysis the method also proved very useful, patients being enabled to get about again, without fear of a recurrence, more rapidly than under ordinary methods. Camphor injections administered in bronchitis increased the secretion at first, and afterwards caused it almost to disappear. They did not seem to be of much use when there was also emphysema. In pneumonia their value was especially marked in weakly individuals or in those with cardiac disease, and they cut short follicular tonsillitis and acute coryza. It was found that in some cardiac cases, where digitalis had ceased to be of benefit, after a few camphor injections, it could be again given with good results. These injections must, of course, be given to children only in very small quantities, but no effect appeared to be produced on the infants of mothers who were being treated by camphor injections for catarrhal pneumonia.—*Medical Record*, October 17, 1891.

THE REMOVAL OF FOREIGN BODIES FROM THE EAR.

Foreign bodies of many kinds get lodged in the external meatus, but in a large proportion of cases the real danger is caused by the interference of ignorant persons, and these accidents become serious, not from the mere presence of the foreign body, but by the unskilful efforts which are made to extract them. Beads, peas, stones of fruit, pebbles, shells, and pieces of slate-pencil are some of the most common substances met with in practice. Among the occasional bodies lodged in the auditory canal we must include larvæ and mature insects. Small fish have also entered the meatus during bathing.

There are cases on record in which foreign substances have been retained in the ear for many years.

The vast majority of these accidents may be brought to a successful issue by the simple use of the syringe and warm water. Fortunately, other methods are seldom necessary. The treatment should be carried out by a trained nurse, and repeated several times during the day. When difficulty occurs in young children, the surgeon ought to make an effort himself to remove the substance under an anæsthetic. An assistant should hold the head well to the side, and at the same time draw the auricle upward and backward, so as to straighten out the canal. In this way the water gets behind the foreign body, and it is soon ejected in the stream.

The Agglutinative Method.—This consists in fixing a brush or piece of wood to the impacted body by means of glue or cobbler's wax, and retaining it in position until firm adhesion has taken place. The substance can then be extracted very easily by careful traction.

Value of Instruments.—Except under special circumstances, aural surgeons are unanimous in condemning the hasty recourse to instrumental assistance. Mr. George Field says instruments are dangerous weapons, and are seldom necessary. In some cases, operations undertaken to extract foreign bodies from the external meatus have been followed by distressing results. Pieces of glass and metal have been pushed down to the bottom of the canal, and then through the membrane into the tympanum and Eustachian tube. It must, however, be admitted that cases do occur in which the substance is so firmly impacted in the meatus that extraction is impossible even by the most diligent and skilful application of the syringe. The question then arises, Shall we allow the foreign body to remain in the ear, or make a judicious effort to remove it? The decision must in every case be a matter for earnest consideration, if the substance is very firmly lodged in the external meatus, and is causing pain and tenderness, accompanied with chronic inflammatory swelling and discharge. Cases may sometimes fall into our hands in which acute inflammatory changes and tumefaction of the canal have been excited by rough and unsuccessful instrumental treatment. Under these circumstances it is certainly right to defer any interference until these symptoms have been reduced by fomentations and deodorizing and soothing remedies.

All kinds of tools have been employed to assist extraction, including single hooks, screw-hooks with little prongs attached to them, bent probes, pins, wire loops, drills, and forceps of many shapes. But the vast majority of such instruments are dangerous weapons. Occasionally a small body, such as a pea or pepper-corn, may be gently lifted up by a delicate little hook from the bottom of the meatus, and then ejected from the passage by a stream of warm water.

In the *Lancet* for October 3, 1891, Dr. John Ward Cousins describes an instrument which he has used with great success in several very urgent cases. It consists of two very delicate loops of wire fixed side by side in a metal stem, and these are so fine that when introduced along the meatal wall they readily slip over the surface of a foreign body. The loops are made in various sizes, and admit of alteration in shape, so that they can be adapted to the varying capacity of the external ear. The snare is especially useful for the extraction of hard and round substances, such as small stones, beads, and peas.

First of all, the organ should be examined in a good light to settle the question as to the presence of a foreign body in the canal. The little patient is then placed under the influence of an anæsthetic, and the auricle is firmly drawn upward and backward by an assistant. The loops are now introduced and placed in contact with the substance, and then by gentle rotation and pressure they can be readily made to slip over its surface. The sliding collar is now projected to secure it, and extraction carefully practised in the right direction. In cases of severe impaction the loops may sometimes slip, so that they have to be reapplied, and another effort performed with greater care and caution. During the extraction much hemorrhage may take place from the meatal wall, but this is of no importance, for it even facilitates the removal of the substance by reducing the tumefaction of the passage. In cases in which the foreign body is of irregular shape the fine single-wire loop, which is attached to the other end of the instrument, is of very considerable assistance. The extraction of any substance is always much assisted by filling the meatus with warm oil, and when the offending substance is lodged in the cartilaginous portion of the canal, its ejection can often be promoted by pressure with the fingers around the tragus and gentle manipulation of the auricle.

SALICYLATES IN PLEURISY.

The *Pester Medicinische Chirurgische Presse* publishes a case of serous pleuritic effusion, reported by Dr. Sigmund Déri, health officer of Kenderes, which has some especially interesting features. The effusion was absorbed by means of a remedy which had been administered for the treatment of a complication of the original disease. An agriculturist, 29 years of age, caught cold, and the next day he had a rigor and pain in the right side. Dr. Déri, having been sent for during the seventh week of the disease, found severe bronchial catarrh and an effusion into the right pleura. After a week's treatment the catarrh decreased, the fever

disappeared, and he then treated the effusion by iodides and diuretics, but without any success. An operation was being thought of, when an accident caused the treatment to be changed with unexpected success. The patient had during the twelfth week of the disease, on a mild February day, been sitting in the open air, and contracted acute rheumatism. Dr. Déri administered salicylate of sodium, which produced considerable diaphoresis, and on the fifth day of the disease all rheumatic symptoms had nearly disappeared, and on percussing the chest the respiration over the seat of the effusion was audible to a surprising degree. The patient continued the salicylate of sodium for another four days, and the effusion was completely absorbed. This case occurred in the beginning of 1885, and Dr. Déri has prescribed salicylates in several cases since with good success. Having given the history of the first case, the question was discussed by what means the same remedy acted beneficially on both diseases at the same time. Does a connection exist between the two affections, or was the complication accidental? Is the effusion absorbed by means of the diaphoretic effect of the salicylate of sodium, or does the latter act as in rheumatism? Does the drug act beneficially in the acute stage of the effusion also, or only later on? Does the treatment prevent a relapse? To answer all these questions Dr. Déri had to collect statistics, the results of which he gives. Until the year 1890 nine cases of extensive serous effusions after pleurisy were treated, but none of them presented a similar complication to the first. Therapeutically, the author comes to the conclusion that, although the salicylate of sodium acts in most cases as a powerful diaphoretic, it is not in this capacity it causes absorption of the effusion, but by some specific virtue similar to that which it exerts against rheumatism. As long as inflammatory symptoms existed—that is, in the initial stage of the disease—the salicylate of sodium had only a very trifling effect, if any; but during the third or fourth week he invariably observed its beneficial effect. Tuberculosis of the lungs and, in a higher degree, of the intestinal canal, as well as dislocation of the heart, contraindicate the administration of the drug. Debilitated patients bear even large doses well, and Dr. Déri never observed unpleasant symptoms of the heart or stomach. No case of relapse was observed. He draws the following conclusions from his observations: Chronic serous effusions into the pleura are often absorbed by the administration of salicylate of sodium. Salicylate of sodium has in pleurisy with effusion a powerfully diaphoretic and probably also a specific effect. The freedom from secondary attacks, procured by the administration of salicylate of sodium, does away with the urgency of operative interference with serous effusions into the pleura, and even relegates the consideration of such interference quite into the background.—*Lancet*, October 10, 1891.

IODIDE OF POTASSIUM IN THE TREATMENT OF DEEP WOUNDS.

Dr. Schleich has administered iodide of potassium in ninety-two cases of wounds of considerable extent or depth affecting both the bones and the soft parts, including operation cases. The progress of each wound was noted for several days before administering the iodide of potassium, as well as during the period of its administration and for a few days afterwards. The cases were mostly those where the granulation process was slow, but during the administration of iodide of potassium in 5½ grain doses three times a day, the surface of wounds, which had been smooth, of a dirty gray color, and partially covered with fibrin, changed in four days to a healthy red color, appearing granular and vascular; the circulation improved, and the secretion, which had previously been very scanty, increased. In other cases, which had all along presented plenty of granulation tissue, the time occupied in the healing of the wound appeared to be shortened by the drug. When the doses were considerably increased, the secretion became profuse and the granulations excessive, very spongy, and wanting in vascularity. He concludes from his observations that iodide of potassium possesses the property of increasing the activity of leucocytes in places where the circulation has been disturbed by wounds. In this manner may also, perhaps, be explained the absorption of effusions and the disappearance of such new formations as gummata, which are apt to be affected by fatty degeneration.—*Lancet*, October 10, 1891.

COLD SITZBATH AFTER CHILDBIRTH.

According to the Berlin correspondent of the *Medical Press and Circular* for October 14, 1891, Dr. G. Pingler has recently put forth a powerful plea for the routine employ-

ment of the cold sitzbath immediately after the expulsion of the fœtus. He first commenced this method of treatment in 1850, and, after twenty-seven years' experience of it, felt himself justified, in 1877, in strongly recommending it, which he did in a pamphlet then published under the title "The Use of Tempered and Cold Water in Pregnant, Laboring, and Lying-in Women" ("Anwendung des temperirten und kalten Wassers bei Schwangeren, Kreisenden und Wöchnerinnen"). The pamphlet did not meet with a warm reception, so after the lapse of another sixteen years he comes up to the attack once more. He recommends that every woman, immediately on the expulsion of the fœtus, shall be put into a sitzbath of a temperature of 8° to 10° R. (50° to 54° F.), that the sacrum and lower abdomen shall be vigorously bathed in the water, and the upper part of the abdomen and loins well douched with water of the same temperature. Every physician, he says, even unacquainted with hydrotherapeutics, will readily understand that this proceeding is one of great importance, and he would add that no procedure as taught by the schools, however energetically applied, can be compared with it, either as regards rapidity of action, or duration, or thoroughness. In at most five minutes the whole genital sphere has its vitality heightened to the highest degree, not for the moment, but in diminishing ratio for days together. Then follows the question, Are the life and health of the woman endangered in any way by this procedure? After long and extensive observation, he is quite convinced that by means of it hemorrhages are prevented, the manual separation of the adherent placenta is rendered unnecessary, and anæmia and septicæmia may constantly be avoided. He requires, however, before making use of the bath, that the patient shall have a bed capable of insuring the necessary reaction, and that, above all, she shall not be lying on straw; further, that the midwife or other person shall without much disturbance see to the establishment of the reaction. For this purpose the hand is to be introduced carefully beneath the clothes, and the hips and thighs and legs well rubbed. If two persons are present, five to ten minutes are generally sufficient for the establishment of the reaction. If this is well established within from ten to thirty minutes, there need not be the least fear that the patient will suffer from the effects of the bath, especially if care be taken that the surface warmth of the patient is equable. But the practical physician is not to be won over by theoretical considerations only; he, therefore, goes on to show the practical results of this apparently heroic treatment. Two midwives in Königstein always used the cold sitzbath in this way. One of them had attended thirteen hundred confinements without a single death. Another had attended seven hundred without a single death, although turning and perforation had been called for. He can vouch also for the fact that the autochthonai of Königstein have not the slightest fear themselves of the sitzbath; the immigrants, however, have; these also are, however, arriving at more enlightened notions. Not only the midwives of Königstein, but those of the surrounding neighborhood, are making use of the sitzbath, and when Dr. Pingler, the author, became chief of the medical district of Königstein, he not only enjoined the use of the sitzbath upon the midwives, but threatened them with punishment if they allowed any patient to die of hemorrhage without having made use of it. At each yearly inspection of midwives he satisfied himself that no death had occurred, not even after abortion. All the midwives declared that the sitzbath had a tremendous influence over uterine contractions. He has obtained the results of two thousand four hundred cases, all of which were favorable, and he asks the question if there is any other new form of treatment the action of which has been so thoroughly tested?

Dr. Fresenius, of Soden, who has also tried it, speaks in most favorable terms of the sitzbath. He says, "I have tried it in a practice extending over years, and make use of it on account of its prompt and permanent action in cases of atony of the uterus. The considerable difference between the temperature of the body and that of the water acting reflexly, immediately sets up powerful uterine contractions that stop the hemorrhage. If the placenta is still in the uterus, a little massage of the fundus, and gentle contraction on the cord, suffice generally for the removal of it. If the contraction is permanent, the patient is placed on a linen sheet over woollen blankets, wrapped in them, and rubbed dry, and after removal of the sheet, wrapped up warmly in bed."

Post-partum hemorrhages, or diseases of the genital passages, have never been observed after this procedure, and as it does not last longer than a minute, the cold vaginal irrigations and other cold applications are unnecessary. Dr. Thewall, another physi-

cian practising in Kōnigstein, also bears testimony to the safety and effectiveness of the sitzbath. Instead of patients becoming more exhausted by the bath, it is refreshing and invigorating, and they often remark that they feel as if they had not been confined at all. It was first of all in the treatment of hemorrhage that Dr. Pingler used the cold bath, then for expulsion of the placenta; he then went on to make use of it for anæmic and weakly women as a prophylactic, and, finally, he directed all the midwives of the town never to omit it in any case, and so the matter stands at present.

In cases where the sitzbath cannot be given, the patient is made to sit on a narrow board over a large vessel, and the loins and abdomen are well douched until the uterus contracts. Both the midwives of the place were once confined at the same hour. Both made use of the sitzbath, and both were at work again on the fifth day after labor. Without going so far as to recommend the adoption of Dr. Pingler's method of treatment in all cases, and under all circumstances, we think he has made out his case, so far as the occasional employment of the sitzbath is concerned. Many women would be horrified at the thought of a cold bath at such a time, and the general practitioner would not exhibit much tact who insisted upon putting a new method of treatment into practice totally regardless of the feelings or prejudices of his patient.

THE TREATMENT OF WHOOPING-COUGH WITH OUABAÏN.

Over a year ago Dr. Gemmell reported his experience with the glucoside ouabaïn in the treatment of whooping cough.

This glucoside has a formula of $C_{30}H_{46}O_{12}$, and is obtained by crystallization from a watery extract of the roots of the ouabaïo, a plant nearly related to the *Carissa Schimperi*. Like strophanthus, the juice of the plant is used as an arrow-poison by the Somalis of East Africa.

Prior to Dr. Gemmell's paper, Dr. Percy Wilde had recommended a trial of it in asthma and whooping-cough, probably from having read of the experiments of two Paris physicians, Professor Gley and Professor Arnoud.

Those gentlemen found that the $\frac{1}{2000}$ grain caused death to a frog by arresting the heart's action. In a dog, $\frac{1}{375}$ grain markedly slowed the respiration without much cardiac disturbance; $\frac{1}{250}$ grain first stimulated, then slowed, respiration, till it ultimately ceased completely.

Hypodermically, it is more powerful than when given by the stomach; $\frac{1}{65}$ grain so introduced is fatal to a man. From the experiments of Dr. Gemmell, the standard dose for a child under 5 years is $\frac{1}{1000}$ grain every three hours in solution. This dose usually lessened the number of coughs and whoops. In two cases, however, where the children were much prostrated by the violence of the cough, $\frac{1}{500}$ grain, and latterly $\frac{1}{250}$ grain, was given every three hours. This is equal to about $\frac{1}{82}$ grain daily, which is nearly double the strength of the dose advocated by Professor Gley, who estimates the maximum daily dose for an adult as 1 milligramme ($\frac{1}{65}$ grain).

Dr. Gemmell, up to the time of writing his article, had treated forty-nine cases; twenty-five patients had been dismissed cured, and four had died (one from diphtheria, one from tubercular meningitis, one from capillary bronchitis, and one from gradual progressive emaciation). The remainder were still under treatment when he wrote. In no case did he notice any ill effects of the drug.

From accurate observation, Dr. Gemmell concludes that ouabaïn is of marked benefit in all stages of the disease. In the first stage, it cuts short the attack; in the second stage, it reduces the violence and frequency of the cough, and diminishes the number of whoops; and, in the third stage, it hastens convalescence.

It is interesting to note how little of the alkaloid in each case was required. In one case the whoops ceased after $\frac{1}{7}$ grain had been given. The time during which this was given was six days.

In another case, which was accompanied by severe vomiting and bleeding, $\frac{3}{10}$ grain was required, given at intervals of four hours for fifteen days.

In the *New York Medical Journal* for September 25, 1891, Dr. I. Lindsay Porteous reports three cases of whooping-cough, two of which occurred in children and one in an adult, in which marked improvement was almost immediately observed after the administration of this drug. To a child of 15 months of age, Dr. Porteous gave $\frac{1}{4000}$ grain in solution every three hours. On the following day the child had only two whoops and less coughing, and at the end of a week was apparently entirely well.

For a child of 4 years of age, he ordered $\frac{1}{2000}$ grain every four hours, and here also cure was noted at the end of a week.

To the adult, a woman of 45 years of age, he ordered $\frac{1}{500}$ grain every three hours, and here also rapid cure is claimed to have taken place.

Dr. Porteous maintains that the action of ouabaïn is evidently not cumulative. During the administration the pulse, temperature, and respiration are slightly lower.

It promotes the action of the skin after three or four days' treatment. The bowels act regularly, and the usual accompanying diarrhœa of whooping-cough is not, as a rule, present during the treatment.

It, like strophanthus, increases the flow of urine.

The appetite in all the cases was increased. Dr. Gemmell likewise noticed this. The toxic effects are considerable slowing of the pulse and respiration, and the latter is the one to be particularly on guard against.

GENERAL VERSUS LOCAL TREATMENT OF CATARRHAL INFLAMMATIONS OF THE UPPER AIR-TRACTS.

At the recent meeting of the American Climatological Association, DR. BEVERLEY ROBINSON read a paper on this subject (*Sanitarian*, October, 1891).

The author deprecated the tendency towards indiscriminate operative interference in cases of nasal obstruction *per se*. The nasal passages are unequal in so large a majority of individuals as to constitute almost a normal condition. If such obstruction from deviation of septum, etc., can be demonstrated to be a cause of disease, then it should be removed, of course. He did not believe, however, that nasal obstruction was so frequent a cause of disease of the nasal lining membrane, or of the ears, eyes, and tonsils, as had been claimed. Warm medicated inhalations are serviceable in catarrhal inflammation of this region, but require added caution, as there is increased susceptibility upon exposure after using them. The nasal douche is often a two-edged sword, with ear-trouble as a frequent sequence. A close and clear relation can often be demonstrated clinically between the general constitutional state and local disease of the catarrhal type in the upper air-tracts. The author had seen many cases of nasal catarrh remain obstinately unaffected by local treatment, the condition disappearing, however, promptly upon the relief of a coincident and related gastric catarrh or torpid, inactive liver. Hypertrophy of the nasal mucous membrane often coexisted with gastric catarrh of the chronic type, which latter must be relieved before the tonsillar troubles will disappear, in many instances. Treatment by galvano cautery often relieves, obviating the necessity for surgical removal. Cauterization is innocuous except in certain conditions of catarrhal inflammation of the nasal mucous membrane, characterized by great dryness and irritability, the formation of scabs and crusts, and a tendency to bleed easily. Carbolized vaseline, or, better, Goulard's cerate freshly prepared, afforded great relief in this class of cases. He did not use as often as formerly the saturated solution of sulphate of copper, once a favorite application in such cases. The association and evident inter-relation of catarrhal affections of the upper air-tracts with the rheumatic and gouty diathesis had been frequently observed by the writer. Such patients were not benefited by exclusively local treatment. A sojourn at some appropriate resort, with the free exhibition of alkaline and antirheumatic mineral-spring waters would effect a cure. Enlargement of the lingual tonsil, a frequent cause of a most obstinate cough, which had been variously termed hysterical, anæmic, or nervous, often depended upon a rheumatic or lithæmic diathesis. He had seen it relieved by outbreaks of overt rheumatism. The mechanism of action involved in the production of this cough by enlargement of the lingual tonsil was through an irritation from pressure upon the epiglottis. Cautery would, at times, relieve this condition, but not always. Carbolic acid and glycerin applications are also effective in some instances. Globus hystericus is quite often due to the same cause,—enlarged lingual tonsil. With regard to chronic laryngitis, he did not believe, with Bosworth, that chronic laryngitis was always a secondary condition, and due to obstruction or other nasal disease. Therefore treatment should not necessarily be directed to the nasal cavities for the relief of chronic laryngitis.

In hay-fever he considered local applications of rather more value than change of residence. A perverted condition of the peripheral nerves is responsible for many of the symptoms. Cauterization of this hypersensitive surface was often of great service. He was not prepared to express a final opin-

ion as to the value of the ice-bag treatment, but had seen it render excellent service.

Finally, as regards the important question made necessary at times by expediency or financial considerations, "Shall the subject of catarrhal inflammations of the upper air-tracts be treated by the specialists or the family physician?" he assumed the position that the best interests of the patient are subserved by a broad view of the subject, much more likely to be taken by the general than the special practitioner; a position corollary to the demonstration of an intimate relation between the local symptoms and causative constitutional states of disease.

THE ANATOMICAL CHANGES OF CURED PHTHISIS.

At a recent meeting of the New York Pathological Society, DR. H. P. LOOMIS presented the lungs from four cases to illustrate these changes (*Medical Record*, October 10, 1891).

The frequent presence of these lesions in post-mortem examinations gave ground for the belief that many more persons recover from tuberculosis than would appear from clinical observations. Out of five hundred and twenty-four autopsies at Bellevue Hospital on persons dying of non-tubercular diseases, forty-three, or eight per cent., presented in the lungs the changes which he considered characteristic of healed tuberculosis. Dr. Austin Flint had stated that out of six hundred and forty cases of phthisis, forty-three, or 6.5 per cent., recovered; and Dr. Williams, of London, reported that out of one thousand cases, 4.6 per cent. were cured. The question of the existence of tubercle bacilli in these apparently healed areas could only be satisfactorily demonstrated by inocular experiments, and in the few experiments of this kind which he had made, these bacilli were not found.

The first specimen showed at the apex of the right lung a dense, circumscribed, circular nodule, three-quarters of an inch in diameter, surrounded by laminated fibrous deposits, and presenting the appearance of a solid cicatrix formed of cartilage. The nodule was situated in the substance of the upper lobe, but connected with the puckered and depressed pleura by easily recognized bands of new connective tissue. The lungs were normal.

In the second specimen, contracted and disintegrated areas were scattered throughout the upper lobe, in which no remnant of pulmonary tissue could be found. The remaining portions of the lungs were normal. Broad white septa of dense fibrous tissue traversed this upper lobe in every direction, the bronchi were dilated and their walls enormously thickened, and a small contracted cavity with walls one-eighth of an inch thick was found near the apex.

The third specimen showed a healed cavity two inches in diameter in the upper lobe. It was closed in on all sides, and lined by a dense fibro-cartilaginous false membrane, which, in places, was one-quarter of an inch in thickness. No bronchus could be found opening into the cavity. The walls were trabeculated, and vegetations projected from them, while in the most dependent portions of the cavity, some grumous, cheesy material had collected. The surrounding pulmonary tissue was indurated and infiltrated with black pigment, but the other portions of both lungs were normal.

In the fourth specimen, the upper lobe, which was normal in other respects, presented a cavity one and a half inches in diameter, having perfectly smooth walls. There was but little connective tissue surrounding this, and a microscopical examination revealed the interesting fact that the cavity was lined with ciliated epithelium, and that it was, therefore, a dilated bronchus, and not the result of tubercular destruction of tissue. Dr. Loomis said that this was only the second specimen of the kind which he had seen.

The PRESIDENT said there was no question about these specimens being tubercular, and he believed with Dr. Loomis that they were of very frequent occurrence, but he would place the percentage considerably higher; for in at least twenty per cent. of the cases dying from non-tubercular disease in the charity hospitals of this city, he found these old cheesy, calcareous nodules in the upper lobes of the lungs.

DR. T. M. PRUDDEN also thought these lesions were very frequently met with. Their exact significance could be best determined by a comparison of such post-mortem statistics with accurate clinical records. He thought it was hardly desirable to speak of all such lesions as those of "cured phthisis," for cases in which living tubercle bacilli were found would be more accurately described by calling them cases of tuberculosis in abeyance.

Reviews.

THE INTERNATIONAL MEDICAL ANNUAL AND PRACTITIONER'S INDEX; A WORK OF REFERENCE FOR MEDICAL PRACTITIONERS. 1891. Ninth year.
New York: E. B. Treat, 5 Cooper Union.
Chicago: 1991 Clark Street. Price, $2.75.

This very useful book appears for 1891 in the same shape as in 1890. As before, we feel convinced that its size and general appearance are by no means as attractive as before the latter year. Its contents, however, are just as valuable, even though the book is less convenient in size. The list of its contributors varies somewhat from last year, but the standard of excellency is maintained. As before, it is indexed in two sections,—new treatment and new remedies.

As we open the book we find "Hypnotism and Therapeutic Suggestion," by A. A. Liébeault, M.D., Nancy. The name of the author is sufficient warrant for the value of the article, which is very full yet very brief. Dr. Liébeault, while acknowledging that he has adopted a "method well known to magnetizers," adds to it not only verbal suggestion, long ago used by Favia to induce sleep, but something more. He hypnotizes one in the presence of many more patients, so that each, waiting his turn, may become familiar with the method, and by thus arousing the imitative faculty and allaying nervousness, he claims greater certainty and greater numerical success. Over nine-tenths of his efforts are successful.

Dr. Liébeault's article is followed by a note on the same subject by Dr. Charles Lloyd Tuckey, whose name is also so closely associated with the British investigation of hypnotism.

The first article on "Phthisis" is by R. Shingleton Smith, M.D., and covers the creosote, balsam of Peru, guaiacol and iodoform, aristol, salol, and the hot- or cold-air treatment. The method of Koch—just rumored at the time of publication—is, perhaps, as well unnoticed.

The second article on "Phthisis" is by Dr. F. de Havilland Hall, and deals with intralaryngeal injections. Dr. R. Shingleton Smith gives also a very valuable paper of ten pages on the "Climatic Treatment of Phthisis."

Dr. F. de Havilland Hall is also author of the article on "Pneumonia," which is of unusual interest and value,—interest as showing the diverse methods of different men in dealing with the same disease; and of value, we hope, because to us the treatment of pneumonia badly needs some further elucidation. The author says, "Dr. H. C. Wood argues powerfully for the use of veratrum viride," and quotes extensively Dr. Wood's argument.

Of new remedies, we find few which were unnoticed in the previous "Annual;" of new uses for old, even year-old, remedies, the "Annual" gives us many useful pages, and we can recommend it as cordially this year as ever before.

E. W. W.

MODERN MATERIA MEDICA FOR PHARMACISTS, MEDICAL MEN, AND STUDENTS. By H. Helbing, F.C.S. 1891. Second edition, enlarged.
Published at offices of the *British and Colonial Druggist*, 21 New Bridge Street, London E. C.

This is the kind of book that one needs nowadays to have at hand. To show its method, let us take its first page. Acetanilide: first its synonymes,—antifebrin, phenylacetamide; then its chemical formula, method of preparation, with the formulæ of reactions, physical and chemical properties, medicinal uses, and a notice of its derivatives,—asepsin, antinervine, salbromalide, and antikamnia. There are no old remedies in the book. All its space is devoted to the recent ones, and we have appended tables on average doses, solubility of new remedies in water and spirit, and melting- and boiling-point of new remedies in Centigrade degrees. The book contains one hundred and fifteen pages, and can easily be carried in the pocket.

E. W. W.

SYLLABUS OF THE OBSTETRICAL LECTURES IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA. By Richard C. Norris, A.M., M.D., Demonstrator of Obstetrics, University of Pennsylvania, etc. Second edition.
Philadelphia: W. B. Saunders, 1891.

This syllabus is designed to meet the difficulty of accurate note-taking. It is interleaved, and is of no special use to others than medical students, unless, perhaps, the antiquated practitioner might like to know his own deficiencies, when a perusal of the book would speedily tell him where he stands or lies, and what strides even obstetrical science has made since the far-off days when he listened to the early lights now gone out. But though only designed for a limited class, Dr. Norris has performed his work with conscientious thoroughness and good sense, covering the whole field of obstetrics. The interleaving of the book makes it doubly useful.

E. W. W.

PRACTICAL SURGERY. By William Johnson Walsham, F.R.C.S. Third edition, revised and enlarged. Philadelphia: P. Blakiston, Son & Co., 1891.

The first edition of the above work was issued as one of the "Student's Guide Series," and had for its object the purpose of aiding the beginner in gaining a general insight into the theory and practice of surgery. It was in no way the intention of the author to supplant the larger and more complete text-books upon this subject; but, as he very justly remarks, their size has grown to such a magnitude that it takes months even to read them; therefore, as an introduction to the study, and an aid in the practical application of knowledge, the work was written. The success of this object may be judged by the fact that the book in a very few years has reached its third edition. Evidently such a demand indicates that the author has well done his task.

The present edition has been revised and much new matter added, so that the work gives a fair outline of modern surgery and the methods of surgical treatment. The additions are more especially to be found in the Section on General Pathology, and particularly that part which treats of inflammation. While admitting other causes for inflammation, micro-organisms "are also believed to play an important *rôle* in the causation of inflammation." The termination of the inflammatory process in suppuration is said to be due to the presence of micro-organisms and the long-continued action of an irritant. Tubercle is described as a new formation, which depends upon the presence of the tubercle bacillus. The book is evidently modern and progressive, and as an introduction to the study of surgery it will be found valuable. J. H. C. S.

ESSENTIALS OF BACTERIOLOGY. By M. V. Ball, M.D. Philadelphia: W. B. Saunders, 1891. Price, $1.00.

The author has accomplished his object, and given us a book which is both concise and practical, which is adapted for students and for the laboratory. A work evidently written from experience in the working laboratory, giving to the beginner the information he so much needs. The difficulties which are met with in the practical study of bacteriology are many, and it is for this reason that many neglect to acquire sufficient knowledge of the subject to utilize this most important means of diagnosis. Every year the field is enlarging, and in order to keep abreast of the period, in order to avoid being left to grope in the darkness of ignorance, the study of bacteriology must be undertaken; its difficulties must be overcome, and it is with such works as the above that one will have to make the beginning. After all, it will be found that the most difficult part is the beginning, but we believe any one with the necessary preliminary instruction which the study of histology and pathology has given him, by carefully following out the directions to be found in Dr. Ball's book, can successfully enter upon the study of bacteriology, which may further be investigated by a study of the more elaborate treatises on the subject.

J. H. C. S.

STUDIES IN PATHOLOGICAL ANATOMY. By Francis Delafield, M.D., LL.D. Vol. II., Part IV. New York: Wm. Wood & Co., 1891. Price, $5.00.

This number of Professor Delafield's "Studies in Pathological Anatomy" gives us a pictorial history of chronic Bright's disease. There are fifty plates, which, with the twenty and more pages of text, make a most complete treatise of the subject. Indeed, with these most excellent micro-photographs, and the accompanying clinical histories of the cases from which they were taken, one has a means of studying the pathological changes that occur during this disease in a manner so satisfactory that the time-absorbing process of preparing specimens for microscopic study may be dispensed with. And further, for the student of pathological histology, such photographs of the pathological changes, taken from typical cases, are of invaluable assistance in aiding him in his studies. J. H. C. S.

THE PRACTITIONER'S VADE-MECUM: A PRACTICAL WORK ON NEW MATERIA MEDICA, MODERN THERAPEUTICS (PHYSIOLOGICAL, MEDICAL, AND CLINICAL), AND RECENT TREATMENT OF DISEASES MET WITH IN ALL BRANCHES OF MEDICAL PRACTICE, INCLUDING VARIOUS OTHER SUBJECTS CONNECTED WITH THE PRACTICE OF MEDICINE. By Edaljee Cawasjee Appu (Tukina), L. M. and S. First edition. Bombay: Printed at the Imperial Press, Kalkadevi Road, 1891. (All rights reserved.)

This book, the preface of which was signed in Bombay in July of the present year, is dedicated to the late lamented Jamsetjee Nesserwanjee Petit, Esq., J.P., and is a remarkable evidence of the way in which the English language and the European civilization are spreading over the whole world. It is composed of three parts, making altogether a volume of nearly fourteen hundred pages, containing, on the whole, a fair statement of

most of our practical knowledge of therapeutics. Its English is a little foreign; occasionally a word is used in an improper sense, but the style is clear, direct, and, considering that the author is a native of a race having a language differing in its root-stock from English, the linguistic performance is remarkable. That it should be written in English for the natives of India indicates a wider and more complete knowledge of the language by the people of that land than we suppose most Americans would have expected. Very many of the newest compounds are noted in the book. "Thiocamph," "Thionaphthol," "Tribromophenol," "Ural," "Morrhuol," "Nitrate of Muscarine," are headings of separate articles hardly to be found in our ordinary therapeutic books. Some of the statements concerning these new substances are evidently based upon excessive credulity on the part of the author in regard to the assertions of Western physicians. Thus, we read that "morrhuol is the curative active principle of cod-liver oil, powerfully increasing the appetite, and a most potent diaphoretic and diuretic;" all of which is probably false. Some things are a little hard to understand,—that is, that a very certain sign of the moribund condition "is the suppression of the catamenia as a diversion in favor of the acknowledged vital functions. This may occur months before the catastrophe arrives." Optic delusions are also given as important death-signs; also "left unilateral dropsy beginning in the foot is a sign of approaching end, and with this is conjoined coolness of the ears, tip of the nose and malar regions, to be followed much later by coldness of the patellar surface." Prowling through the book, we find various things which we would like to know whether they are true or not. For instance: "There is something remarkably singular and unaccountable regarding the action of the elaterin in producing such a great flow of serum, and causing it to *coagulate in the vagina*. We believe it is the only drug which has this power." Some things smack very strongly of the Indian soil; as, for instance, "Oxalic acid gravel, or *poor man's* gravel, is due to exclusive vegetable diet."

The final judgment to be made on a book like this, of course, varies with the standard by which it is judged. It does not compare favorably with the best efforts of European or American book-making; it does show wide knowledge, and indicates a good deal of practical medical skill; and it is very remarkable as having been written by a native of India. English, Russian, American, German, and writers of other nationalities are quoted, probably some of them at second-hand.

We congratulate Dr. Appu, and trust that his own countrymen will come to regard his work as what he claims it to be,—namely, "an invaluable guide for ready reference and practical use."

THE COMPARATIVE ANATOMY OF THE DOMESTICATED ANIMALS. By A. Chauveau, M.D., LL.D. Revised and enlarged with the co-operation of S. Arloing. Second English edition translated and edited by George Fleming, C.B., LL.D., F.R.C.V.S. With five hundred and eighty-five illustrations.
New York: D. Appleton & Co., 1891.

When "Chauveau's Anatomy" first appeared in its English dress seventeen years ago it at once assumed the position towards veterinary students that "Gray's Anatomy" has held for so many years for students of human anatomy; but, unlike the latter, the English translation of "Chauveau's Anatomy" has not been kept abreast of the times, though four editions have appeared in the French language since it was first translated. Though this neglect has led to the appearance of many rivals, "Chauveau's Anatomy," as it now stands, is easily first, as it is, in fact, indispensable. The reputation of its author and editor is sufficient to prove that this work is all that it claims to be, and it may now continue to be accepted as in every way worthy of the position accorded to it as the best on the subject.

A TREATISE ON PRACTICAL ANATOMY. By Henry C. Boenning, M.D.
Philadelphia and London: F. A. Davis, 1891.

It is with much gratification that we notice there has been during the past few years quite an impetus given to the study of anatomy,—that is, if one may draw conclusions from the number of works which have been published on this subject. In Philadelphia alone we have had issued from the press the works of Allen, Nancrede, Young, and McClellan, also recent editions of the classical works of Gray and of Leidy, and to day we have for our notice the above work of Dr. Boenning.

Of all the divisions of the study of medicine, that of anatomy may be considered more especially a study which has for its acquirement the cultivation of the memory. There are few or no theories to be decided; there are no hypotheses to puzzle, and there are few conflicting opinions to reconcile. It is a study of facts which are to be memorized,

and it is the presenting of these facts in a brief and easily-remembered manner that makes the successful book. As an evidence of the truth of this statement, we need only mention the work by Gray.

Our author, it may be said, has given us the facts of anatomy, as they are understood and taught at the present day, in a concise and readily comprehensible way. More especially is this noticeable in the sections which treat of the joints and of the muscles; indeed, the entire context of the book is highly creditable to its author. We regret we are not able to say the same of the illustrations, many of which are not good, and a few are positively bad. J. H. C. S.

A MANUAL OF PRACTICAL OBSTETRICS. By Edward P. Davis, A.M., M.D., Clinical Lecturer on Obstetrics at Jefferson Medical College, etc. With one hundred and forty illustrations, two of which are colored. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street, 1891.

This work seems to us to fill a much-felt want,—that of a small but good work on obstetrics, well illustrated, and containing all that the student is likely to need. The illustrations are all good, large, and complete. The text is plain and yet full enough, and the whole book is very satisfactory. It is not a primer, or a compendium exactly, but a small obstetric text-book, complete as most other works, with the padding left out. It does not tell us anything about antediluvian births, or archaic forceps, nor all the errors of the past about generation, conception, and the ovum. The student and practitioner can get as much out of it as out of the most elaborate works in many volumes for most of his needs, and the encyclopædic works he can purchase later. E. W. W.

Correspondence.

LONDON.

(From our Special Correspondent.)

A very simple and physiological method of obtaining blood suitable for purposes of transfusion has just been worked out by Dr. Wright at the laboratories of the Colleges of Physicians and Surgeons. It depends on the principle, already known, that blood when decalcified loses its coagulating power (regaining it, however, on the re-addition of calcium salts). Dr. Wright withdraws blood direct from a vessel, and allows it to flow into a beaker containing a solution of potassium oxalate. The lime salts are thus precipitated in the form of insoluble oxalates. It is found that the presence of one-tenth of one per cent. of potassium oxalate is sufficient to prevent coagulation in dog's blood, double that amount being required in ox blood. The method has been tested on dogs by withdrawing successive portions of their blood into potassium oxalate solution, keeping those which show no signs of coagulation, and then bleeding the animals nearly to death. Injection into their vessels of the decalcified blood is then made, and is said to be a perfectly efficient method of restoring the animals. I am not aware whether Dr. Wright has determined the effect of the transfused blood on the remaining corpuscles, but however this may be, this decalcified blood should possess great advantages over both simple saline solution and defibrinated blood, which latter, from the fibrin-ferment contained in it, is apt to set up intravascular coagulation.

The theatre of the Examination Hall of the Royal Colleges of Physicians and Surgeons has been the scene of many interesting orations, but none have been more valuable than the course now being delivered there by Dr. Burdon Sanderson, the Croonian lecturer for the year. This year the theme is the "Progress of Discovery relating to the Origin and Nature of Infectious Diseases," and at no time have we felt more the need for a summary of this kind. These lectures are, however, something more than a mere summary, for all through we see the immense amount of individuality thrown into them by the orator, than whom nobody could have been found more qualified both by his scientific reputation and by his own vast researches to give a reliable opinion on this most difficult subject. The course consists of four lectures, but the subject more naturally divides itself under three heads, so that Dr. Sanderson has devoted the first three lectures to two subjects,—namely, 1, the causes of acute diseases and their mode of operation; 2, the reaction of the organism against the operation of morbific agents. The last lecture will be devoted to "Specificity, or the Relation between the Distinctive Characters of Specific Diseases and those of the Specific Causes which Produce them." At the time of writing I can give an account only of the first two, but I hope, before closing, to be able to give also a brief account of the third lecture.

In commencing his subject, the lecturer traced, first, the origin and development of the doctrine of the infective nature of inflammation, this being the pivot on which pathological doctrines on other subjects have always turned. Commencing with the old idea that whenever inflammation occurs after injury, whether mechanical or chemical, the *apparent* cause is the real one, he traced the gradual acquisition of the facts which overthrow this doctrine. We now know, of course, that the old dictum is not in the majority of cases true, and that, however direct may be the relation between damage done and the reaction which follows, inflammation does not occur unless there be present at the seat of injury something analogous to the contagia which are the acknowledged necessary agents in the production of specific diseases. In all cases we must now distinguish between the contagium, or proximate cause, and the injury in presence of which it is enabled to act.

This doctrine has, however, only very gradually been established. In 1871, Dr. Sanderson made, with Dr. Klein, some very important researches on suppuration. It was found that the presence of microphytes, either cocci or bacilli, was so characteristic of such a condition that there seemed little doubt that it was to them that the pus owes its infecting properties. During the subsequent years many observations were made which threw light on the part played by microphytes in the causation of inflammation. It was found that the effect of the introduction of microbes into an animal depended very much on local conditions as well as on the nature of the microbes introduced. As a rule, if the matter introduced could become rapidly absorbed, no harm would arise, but failing this, inflammation was produced. This knowledge led to the introduction of the principle of drainage in surgery. The inference drawn at that time still holds good at the present day,—viz., "Air enclosed in a serous membrane is harmless, water is harmless; even septic organisms are harmless, provided that they are rapidly absorbed." Danger at once arises, however, if any of these should remain in a cavity, which, although inside the body as regards temperature, is outside it in so far as it is beyond the reach of living tissue. A further great advance was made when it was recognized that all microbes were not equally harmful. A distinction was discovered between microbes on the one hand which lived on dead tissue (pure saprophytes) and those which had the power of attacking living protoplasm. Without some such idea, it had been impossible to account for the examples of pyæmia supervening on valvular disease in the absence, apparently, of the introduction of infective material from without. The secondary foci of inflammation always contained microbes of definite appearance, whose presence could not be accounted for without a knowledge of their parasitic properties.

Such was the knowledge possessed till 1880. Then came the most important discovery that in all ordinary cases of acute suppuration the pus contains microphytes which are special to it. This was developed still further when, by the aid of Koch's new methods, it became possible to separate species of microbes from each other and to obtain them in pure cultures. These facts were brought to light in the first instance by Professor Ogston, who found that in sixty-four abscesses all contained microbes of some sort: seventeen contained chains only, thirty-one only clusters, and the rest contained both. He found that liquids containing any of these were capable of setting up suppuration when injected subcutaneously, but that the resulting lesions differed in the two cases. Staphylococcus produced a circumscribed abscess, whereas streptococcus always found its way into the neighboring lymphatics.

The lecturer then proceeded to describe the lesions produced by the yellow cluster coccus (staphylococcus) and by the chain coccus (streptococcus). The difference in action between these two seems to be rather of degree than of kind. They first attack and finally destroy the vitality of whatever living tissue is brought within the range of their influence. In all vascular tissue they produce congestion, exudation, and emigration of leucocytes; in fact, the first stages of inflammation. This access of cells, etc., appears to be a protective process, and it seems that though these cells are constituents of a morbid process, they aid in the destruction or elimination of the *materies morbi*. Dr. Sanderson will not admit, however, that this action in attacking and incorporating microbes is the chief or only way in which the human or animal organism protects itself.

In his second lecture the orator discussed the chemical origin of inflammatory processes. One cannot now dogmatize so far as to say, as did Weigert formerly, "No suppuration without bacteria." Indeed, one must, in a way, return to the old doctrine, and maintain that the proximate cause of suppuration is

always chemical, for it has been conclusively proved (1) that suppuration can be produced by chemical agents without the presence of microbes, and (2) that when it is produced by microbes the action is really chemical. This is a startling statement, but one which must, nevertheless, be accepted, for the experiments of Councilman and of Scheuerlen prove conclusively that sterile abscesses can be produced by the aseptic subcutaneous introduction of perfectly sterile irritant liquids. The second point has been proved by very numerous experiments on devitalized cultures of pus-producing microbes, which will produce sterile suppuration quite as readily as the irritant fluids above mentioned.

The behavior of leucocytes in relation to microbic infection has for several years attracted the attention of pathologists. This wandering seems so purposive that it has repeatedly suggested the idea that the cells are guided by something like discrimination. Of late, in the hands of Metchnikoff, the theory that leucocytes are endowed with special protective powers against contagious microbes, which they first swallow and then digest, has been so ably advanced that it has exercised a marked influence on our views. The doctrine of phagocytosis has to include also an explanation of the manner in which leucocytes are drawn to the seat of inflammation, and this receives apparently a very complete solution from the study of the attractive influence of the substances produced by the microbes,—chimiotaxis, as it is called. To see this, it is only necessary to introduce into the dorsal lymph-sac of a frog a capillary tube containing a sterile culture of some pyogenic microbe. On withdrawing it, after a time, it will be found full of leucocytes. That this is not due merely to irritation may easily be proved by introducing simultaneously another tube containing some indifferent fluid, such as fresh frog's bile. This tube, on being withdrawn, will not be found to contain any leucocytes. Metchnikoff argues that the cells in thus "going for" bacterial products are actuated by an almost conscious selection as to what is good and what detrimental to the organism as a whole. The facts do not, however, warrant this idea. Indeed, in what follows, Dr. Sanderson shows himself by no means a partisan of "Metchnikoffism." Metchnikoff's theory, put simply, rests on a theoretical conception,—namely, that the powers of a leucocyte to enclose any small particle present in the medium in which it lives is an attribute derived by inheritance from the remote progenitors of the animal of whose body it forms a part,—that is, eventually from amœba and less remotely from cœlenterates, the mesodermic cells of which enjoy this power to a marked degree. The phenomena have been known for years, but it remained for a morphologist, like Metchnikoff, to point out that we misinterpreted them, and that they form really a protective mechanism. He further pointed out that these "phagocytes" are of two kinds, and calls them distinctively "microphages" (leucocytes, etc.) and "macrophages" (connective-tissue corpuscles, giant cells, etc.). When the body is invaded by microbes, Metchnikoff imagines a "struggle for existence" to occur between microbes and phagocytes. In this struggle the leucocyte is supposed to "adapt itself to its surroundings." Not only this, but the adaptation thus acquired is said to be transmitted to its posterity, thus explaining their protective power. All this is extremely attractive, and there seems a very enormous amount of evidence in its favor. I have not room here to give all the facts quoted by the lecturer as advanced by Metchnikoff in support of his theory. Suffice it to say that the subject has been approached in three different ways,—namely, 1, by ascertaining in what way the multiplication of microbes within the body is affected by the intervention or exclusion of leucocytes; 2, by direct observation of the changes which the swallowed microbes undergo when watched under the microscope; and, 3, by comparing susceptible with insusceptible animals in regard to the manner in which they deal with microbes when introduced into their bodies. By a very ingenious series of experiments, Metchnikoff, following all these three directions, has obtained what seems, at any rate at first sight, very strong proof of the accuracy of his views. The part of the "macrophage" is, according to him, secondary to that of the "microphage," which forms the first line of defence against microbes. If this line be broken through, the second line, and generally an ineffectual one, is constituted by the large tissue-cells of the liver and spleen.

Hess and Bouchard are often referred to as supporters of the phagocytosis theory, but neither of these observers can be said to go the whole length with Metchnikoff in admitting the selective power of the cell. Neither observer appears to admit more than the mechanical action of the cells. They do not admit with him (1) that the devitalization of microbes is a special and exclusive privilege of phagocytes, and (2) that leucocytes can

discriminate between contagious particles of different kinds, and that they exercise this power of choice "for the good of the organism."

Passing to another phase of the subject, the lecturer went on to suggest that there is a link between local reaction and liability to infection, not of the nature of that suggested by Metchnikoff, but as products of the same antecedent conditions. The explanation offered by Dr. Sanderson, that a virus of great intensity does not produce festering, is that it is *intense;* in other words, that the same agent which in smaller concentrations excites exudation and emigration, paralyzes these processes when in greater intensity. Now, Bouchard's researches have thrown much light on this difficult subject. They are not quoted at any length, but their starting-point was undoubtedly the observations of M. Charrin on the microbe of blue pus. When injected into the blood this produces very definite symptoms, —collapse, intense enteritis, and death. The separated products of this bacillus are also capable of producing just the same train of symptoms. Now, it is this substance which possesses the required power of inhibiting local reaction. In the rabbit, cultures of the bacillus produce, when injected, death without suppuration; in guinea-pigs, which are more resistant, death does not occur, but a local inflammatory process at the seat of injection. Now, prepare a guinea-pig by first injecting it with a sterile culture, and it becomes to all intents and purposes a rabbit, dying after inoculation without any sign of local mischief. Bouchard says that this change is not due, as suggested by Metchnikoff, to a paralysis of amœboid cells (a negative chimiotactic action), but to a general action on the whole machinery of living tissues. He classes the chemical action of microbic products with such general depressants as cold, exhaustion, or even mere restraint of movement, each of which he shows to favor infection by diminishing local reaction.

What explanation, says Dr. Sanderson, can be given of all this but one,—namely, that in each instance the same cause which weakens local reaction weakens also in the same degree the defensive power of the organism as a whole against infection? In what this power of defence consists he has endeavored to set forth in the third lecture, which has just been delivered. Time and space will not allow me to do more at present than just to indicate the scope of this lecture. I must reserve its more detailed consideration for my next letter. This third lecture was divided into two great headings,—1, the question of mitigation (diminution of virulence); 2, that of acquired immunity and the various theories which have been advanced to account for it. In considering these he passes from the study of the "phlogogenic" to that of the "specific" infections. He describes the various means which have been found capable of diminishing the virulence of an infection,—growing at a high temperature, in an atmosphere of compressed oxygen, or in the presence of antiseptics. He notices also Pasteur's observations on the protective power of such attenuated cultures against infection with virulent material. I find, however, that I cannot do anything like justice to the material at my disposal before the mail starts, so with these few hints as to the nature of the lecture I must close this month's letter. Whether Dr. Sanderson has been quite just as regards the phagocytosis theory cannot be said until the whole of his evidence is before us.

Notes and Queries.

PRESCRIPTIONS AND PRESCRIBING.

Is the art of prescribing to be numbered among the lost arts? A correspondent, with some show of reason, would wish us to believe this question is to be answered in the affirmative. He gravely asserts that doctors study the advertisements of enterprising pharmacists more than their materia medica, and he fears that in the future patients will be as wise as their medical men if they take in the same literature. Doubtless the so-called elegant prescription, with its rigid adherence to the rules enforcing the presence of a basis, an adjuvant, a corrective, and a vehicle, is now rarely met with; and, although certain examining bodies still struggle to maintain the ancient Latin form of the prescription, yet little by little the Latinity seems to be slipping away. The symbols remain, but abbreviations obviate difficulties with doubtful genitives and undeclinable substantives of recent invention, and the directions are, more often than not, written at full length in English. It is difficult to account for these tendencies. Perhaps they are the result of the importance at present attached to the study of the various branches of science, which leaves little room for the cultivation of the older proud boast of languages. Perhaps they are the almost unconscious expression of

a feeling that in medicine the days of mystery have passed away. The prescription, with its mystic symbols, which merely indicated more or less unnecessary directions to the dispenser, although regarded with awe, is no longer felt to represent the acme of skill. Among certain classes of patients it retains its former potent sway, and continues to be interchanged among friends as a talisman; but the more enlightened sections of the public prefer to be treated as individuals, to whom special instructions of diet and mode of life mean almost as much practical benefit as the prescription. Moreover, in many instances they prefer to know what is being ordered, and although this knowledge may convey very little enlightenment, there may possibly be a certain satisfaction in finding two or three lines in the familiar vernacular. Consulting the wishes of patients, therefore, it would seem that it is scarcely worth the trouble to keep up a semblance of secrecy on paper. On the other hand, for those in the profession who can, but do not, write their prescriptions in Latin, the explanation may possibly be found in some unavowed lack of confidence in the subsequent translation of their directions. Many venerable jokes upon this subject have had their serious side and effect. While they have served as object lessons to young dispensers, they have equally caused a gradual disinclination on the part of the prescriber to run any facetious but undesirable risks. But apart from the way in which the directions are written, the component parts of the prescription fall under eager scrutiny. The small mystifications of Fowler's solution, of soap pill, of spirit of Mindererus, or even of solution of trinitrin, cannot hold out against the inquiring spirit of the age. Patients have been known to go to the nearest free library to solve the problem. Perhaps one natural outcome of this is the "growing tendency," of which our correspondent complains, to prescribe secret and special nostrums. "When patients become aware that they have paid for a prescription of 'somebody's syrup' which they may have tried before or may have seen recommended in the daily papers, they are inclined to think the fee is wasted, and to lose faith in the doctor; while if they get relief from the patent compound, they tell all their neighbors how to do without the doctor." He further complains of the loss and inconvenience occasioned to the chemist by embodying in a prescription certain preparations to which the names of the makers are attached. In the modern nomenclature of diseases many proper names, undesirably, as we think, are linked to groups of symptoms, for the convenience of abbreviation or with the intention of conferring honor; but is there any justification for the extension of this principle to drugs? Is there any gain in selecting the tincture, syrup, or pill prepared by any particular firm? Our correspondent thinks not, and does not hesitate to employ a harsh term to those addicted to this practice. Still, there are two sides to every question. These preparations have frequently been most carefully made, with appliances whose cost can only be met by wholesale manufacturers. They are usually prepared with every conceivable precaution for insuring uniformity of strength, and when their efficacy has been repeatedly tested, it seems somewhat hard to accuse those who employ them of quackery. The term is only appropriate when such substances take the place of a prescription, the prescriber being alike ignorant of their compositions and actions.—*Lancet*, October 17, 1891.

PARALYSIS AFTER A SUBCUTANEOUS INJECTION OF ETHER.

EBERHART (*Centralbl. f. Gynäkol.*, No. 12, 1891), having observed cases of paralysis after subcutaneous injection of ether, has carefully gone through the literature and has succeeded in finding but few cases. In one case reported by Remak the patient, who lay comatose after poisoning by carbonic acid, received a subcutaneous injection of ether into the extensor side of the forearm. There resulted a partial paralysis of the radial nerve, which was limited to the extensor communis and abductor pollicis longus. Three years before he had observed a similar case, the muscles of the index finger only being spared, which required four months until the muscles recovered their power completely. He regards ether as having a specially deleterious action upon the peripheral, and especially here upon the deep branch of the radial nerve, after its piercing the supinator brevis. In Mendel's case the paralysis involved the third and fourth fingers, with reduction of sensation immediately after an injection into the extensor side of the right forearm. There was no reaction of degeneration, but the galvanic and faradic incitability were reduced. Restoration took place in three weeks. In a case of Neumann's, the patient, a consumptive, received two subcutaneous injections, one into

each forearm. The points of puncture became, on the third day, painful and swollen; on moving the hands, there was painfulness of the extensors and diminished mobility of the middle fingers. The paræsthesia soon disappeared and the mobility of the fingers soon was restored entirely. The writer can only find these cases in the international literature. [There is a case reported in the *Edinburgh Medical Journal*, 1890, of "Local Paralysis after Ether Injections," where the writer collected several cases unmentioned by Eberhart. The Index Catalogue of the Surgeon-General's Library at Washington gives some cases which are also left out in the *Edinburgh Journal* article. — TRANS.] The writer adds a fourth case to the list from his practice, and calls particular attention to the danger of using ether injections in collapse during operations and childbirth, which point is by no means dwelt upon or even mentioned in the text-books. Schröder is the only writer who advises one to give the injection cautiously and not deeply. The writer administered, during the course of an operation for prolapse of the uterus, on account of collapse, a subcutaneous injection of ether into the right forearm. The next day it was observed that she could not extend the third, fourth, and fifth fingers. After forced extension the fingers would fall back into the half-clinched position. Faradization was employed while she lay abed, but the paralysis remained unaltered. Only after four weeks did she begin to move her middle fingers, and after six weeks was the mobility of the fingers restored. The writer, on account of the persistence of the paralysis, is of the opinion that the point of the hypodermic needle must have struck a branch of the radial nerve, or that the ether set up a neuritis. Whatever may be the explanation, he advises greater care in the use of ether. Tincture of musk or oleum camphoratum may be used as substitutes, for they act fully as well as stimulants, and have no such disagreeable side action. If one will use ether, then one should inject where the nerve-branches are few in number and well covered by skin and fat.—*Journal of Nervous and Mental Diseases*, October, 1891.

ABSORPTION OF PROTEIDS.

R. NEUMEISTER has made a large number of researches on this subject, which are conveniently grouped in the *Zeitsch. f. Biologie*, 1891, xxvii. p. 309. It is well known that some proteids when introduced directly into the blood-stream are excreted as foreign bodies, while others are not so excreted. Neumeister finds that those proteids which, when injected into the blood of dogs, are not excreted by the urine as foreign bodies, but are assimilated, are such proteids as those which, when introduced into the stomach, can pass from the stomach and intestine *via* the absorptive channels without undergoing change by the digestive processes. They are syntonin and albuminate, — that is, alkali-albumen from egg albumen,—muscle syntonin, phyto-vitellin from the seeds of the gourd, and pure serum albumen. Those proteids, however, which do not pass into the blood without undergoing change in the process of absorption, are excreted as foreign bodies; for example, normal egg albumen, casein, hæmoglobin, albumoses, peptone. The experiments of many previous observers have shown that probably the peptone formed during digestion is transformed into coagulable albumen in the mucous membrane of the intestine. Neumeister, by a single experiment, has demonstrated this "peptone-changing" function of the mucous membrane of the small intestine. If a piece of "surviving" intestinal mucous membrane be taken from an animal just killed, and if it be added to blood containing peptone at 40° C., and the whole well ventilated with air, after a time a very considerable quantity of the peptone disappears, and the same is the case with the albumoses; but in the case of albumoses they are first changed into peptone. This peptone changing function of the intestinal mucous membrane is found in the small intestine of the dog, rabbit, pigeon, and pike, and is possessed by the liver of the rabbit, but not by that of the dog, nor can the kidney, muscles, or blood of the dog effect this change.—*British Medical Journal*, October 10, 1891.

IODO-NAPHTHOL-BETA—A SUBSTITUTE OF ARISTOL.

DR. BRAILLE has recently prepared, with beta naphthol, a new iodated derivative analogous to aristol, to which he has given the name of iodo-naphthol-beta, or naphthol-beta diodide. It is prepared by mixing a solution containing 24 grammes of iodine and 27 grammes of potassium iodide with another solution containing 110 grammes of naphthol-beta and 40 grammes of caustic soda. There is then added a little solution of the hypo-

chlorite of sodium corresponding to ten times its volume of chlorine. Iodo-naphthol is then precipitated in the form of a greenish-yellow powder, which is to be washed and then dried, the greenish color becoming more marked on exposure to the light.

This body is said to be inodorous and tasteless, insoluble in water, partially soluble in ether, very soluble in chloroform, and scarcely soluble at all in alcohol or in acetic acid.—*Répertoire de Pharmacie*, November 10, 1891.

LYSOL—THE CRESOLS AS DISINFECTANTS.

The first question suggested by such a title is naturally, What are the cresols exactly? In order to answer this it is best to go back to the beginning and to start with coal-tar, the product (with coke and illuminant gas) of the dry distillation of coal. By fractional distillation this coal-tar is separated into parts, having various boiling-points, principally as under—

1. A small fraction (amounting to two to four per cent. of the tar) containing what passes over at 80° C.,—namely, ammonia, carbon bisulphide, methyl cyanide, alcohol, amylene, benzene and its homologues.

2. The light oil; forms six to eight per cent. of the tar, and includes the constituents boiling between 80° and 210° C., chiefly made up of benzene and its homologues, with some naphthalene, phenols, and bases.

3. The heavy oil, thirty-two to forty per cent. of the tar; this is made up of what goes over between 210° to 400° C., and consists of naphthalene, phenols, high boiling bases, anthracene, phenanthrene, fluorene, and other hydrocarbons.

The residue in the retorts represents—

5. The pitch, in quantity of from fifty to fifty-five per cent.

The heavy or creosote oil on cooling deposits solid naphthalene; the separated oil is treated with concentrated soda lye, the insoluble part separated from the dissolved sodium phenol, and the latter decomposed by sulphuric, carbonic, or sulphurous acid. Crude carbolic acid rises to the surface of the solution of sodium sulphate, carbonate, or sulphite. By fractional distillation of this crude acid between 185° and 205° C. cresols are obtained, which appear to consist of a mixture of the so-called ortho- and para-cresol, and have the general formula $C_6H_4CH_3OH$, from which it will be seen that they are carbolic acid, or phenol (C_6H_5OH), in which one hydrogen atom is replaced by a methyl group, CH_3. What a difference in some physical properties this replacement of an atom by a group makes we shall see presently.

Ortho-cresol, or orthotoluidine, melts at 31° C. and boils at 185° to 186° C.; meta-cresol is a thick liquid that even at 80° does not solidify, and boils at 195° to 200° C.; para-cresol occurs in colorless prisms, melting at 36° C. and boiling at 198° C. They are all practically insoluble in water.

Lysol, which is obtained by dissolving in fat, and subsequently saponifying with the addition of alcohol, the fraction of tar oil which boils between 190° and 200° C., is a brown, oily-looking clear liquid, with a feebly aromatic creosote-like odor. It contains fifty per cent. of cresols, and is miscible with water to a clear saponaceous, frothing liquid; it also forms clear solutions with alcohol, petroleum or benzene, chloroform, carbon bisulphide, and glycerin.

The essentials of a perfect ideal antiseptic may be briefly stated as follows:

1. It must be soluble in water, and ought to be clearly so.

2. It must arrest the development of pathogenic bacteria, even in very dilute solutions, and after a comparatively brief period of action.

3. It must be harmless,—that is, non-poisonous and non-corrosive.

4. It must not be too expensive.

Lysol meets these requirements.

It forms clear mixtures at once, in every proportion and at all temperatures, with distilled water, or ordinary well-water.

The mixture possesses—and therein lies a prominent advantage of lysol—the property of a saponaceous solution, which renders the use of a special soap in surgery quite unnecessary. The generally complicated processes of cleaning and disinfecting the area of operation are completed in a single act,—viz., an energetic brushing with the solution of lysol. It acts in a manner equal to the best soap as an excellent cleaning agent, which removes all dirt, fatty or resinous spots, etc., from the skin as well as from the surroundings, linen, instruments, and the like.

Lysol is superior in bactericidal power to carbolic acid and other preparations of the higher homologues of phenol, and is possessed of powerful deodorizing properties.

Lysol is neutral. In alcoholic solution phenol-phthalein produces no change. In aqueous solution a reddening appears, but this is traceable to the recognized dissocia-

tion of neutral soaps under such circumstances into acid salt and alkali. It is also free from poisonous properties—the relative harmlessness of the cresols even when taken internally in large quantities has been often demonstrated—and is non-caustic. The mucous membrane is unaffected by the application of a one-half-per-cent. solution, and though stronger concentrations produce a more or less pronounced sensation of burning, this disappears on the application of a little plain water.

Lysol has been introduced into a number of surgical, and particularly in lying-in clinics, from the experiences of which it has been concluded—

1. That through its simultaneous cleansing and disinfectant action, in conjunction with its relative non-poisonousness, lysol is superior to the disinfectants commonly in use.

2. That its application is more convenient and less dangerous than that of any of the other agents of the same class.

As has been already intimated, lysol has been largely and satisfactorily used in midwifery, for irrigation of the uterus and vagina, and in gynæcology generally, where its powerful deodorizing properties prove of the greatest value.

In surgery generally it is being extensively adopted in one- and two-per-cent. solution for the disinfection of the operator's hands, of the field of operation, of instruments, sutures, etc., and for irrigation of wound surfaces. Amputations, extirpations of various tumors, operations for hydrocele and hernia healed in the most satisfactory manner, and partly by first intention.

Dr. Unna has used lysol in various skin-diseases in the form of a plaster mull, and was favorably impressed with it; he classed it among substances which do not produce pain. It will prove valuable in the treatment of rhino-pharyngeal and laryngeal diseases, as well as in affections of the middle and external ear. In short, the application of lysol is indicated wherever any morbid processes associated with the formation of pus and other disintegration products are going forward. It should also be tried in skin affections, especially eczema, or such as are of parasitic nature, and in the treatment of burns and wounds generally.

Lysol forms an efficient general disinfectant. The walls of a room, and the dwelling generally, may be freed from germs by the intelligent and thorough use of a spray containing a one- to three-per cent. solution. It seems likely that lysol may become a permanent institution in the household for the purpose of domestic cleaning, the disinfection of sputa, etc. For such uses its saponaceous character and perfect solubility in water again manifest themselves as not the least important among its many advantages over other substances of the same class.—*Pharmaceutical Record*, November 12, 1891.

THE TREATMENT OF POSTERIOR URETHRITIS.

To avoid the irritation produced by the catheter in this affection, Dr. Rona makes use of an irrigator provided with an olive-shaped rubber tip. By inserting this into the meatus it is possible to wash out the entire urethral canal, which can seldom be accomplished by the syringe. With the syringe the force of the injected fluid is expended upon the anterior part of the canal, while the resistance of the compressor urethræ is not overcome, but by the employment of the irrigator the resistance of this muscle can be overcome in a few seconds, especially if the patient's attention is diverted by conversation. The quantity of fluid to be injected varies from 100 to 150 grammes; it should be lukewarm and of unirritating character (*Monatsh. f. Prakt Dermatolog*, Bd. xii. Hft. 11, 1891).—*International Journal of Surgery*, October, 1891.

BROMOFORM IN WHOOPING-COUGH.

The statistics which we have from time to time published as to the value of bromoform in the treatment of whooping-cough have been extended by the report by Dr. Schipper of one hundred and forty-nine cases in which this remedy was employed (*Gazette Médicale de Paris*, November 7, 1891). The age of the patients varied between 4 weeks and 8 years; the remedy was given in doses varying from 1 to 5 drops, suspended in sweetened water, the quantity varying according to the age of the patient, and administration taking place four times daily. The author states that his results were more favorable in summer than in winter, while the fact that in some instances treatment was prolonged for more than eight weeks shows conclusively that this remedy does not exercise any specific action on whooping-cough. Nevertheless, the author maintains that, administered in the above doses, it is perfectly

harmless; that it rapidly diminishes the number and violence of the attacks, while under its influence the duration of the malady is decidedly reduced. After two or three days' treatment vomiting ceases, as well as hemorrhages from the mouth and nose. Further, the remedy is claimed to prevent complications, such as pneumonia, by the diminution in the congestion of the thoracic organs which is apt to result from the violence of the cough.

A NEW THEORY OF THE FUNCTIONS OF THE CEREBELLUM.

In the present state of our knowledge, or rather ignorance, concerning the function of the cerebellum, it is interesting at least to note the various theories suggested concerning it, and it may be useful as well, since it is by comparing the different theories, and weighing the evidence brought forward in support of each, that we shall finally arrive at definite knowledge concerning this mystery of the nervous system. Since Flourens's time it has been pretty generally believed that the cerebellum has a purely motor function, and although it is not now regarded as a co-ordinating centre, still this observer's dictum, that a man "no more thinks with his cerebellum than he does with his diaphragm," is still accepted by many as true. Recently, however, Dr. Courmont, of Lyons, was led, during the course of a clinical study, to look more closely into the question of cerebellar physiology, and the result of this investigation has caused him to reject the previously-accepted view of its motor function as incorrect. The statement and arguments for his theory, which is substantially that put forward rather timidly by Jessens in 1869, but which found little acceptance among physiologists, are contained in a book now in press, advance notice of which is published by Professor Folet in the *Bulletin Médicale*, No. 45, 1891.

Briefly stated, Courmont believes that the cerebrum and cerebellum are similar in function as well as in structure. Just as the cerebrum is not only a motor organ, but the seat of cogitation as well, so the cerebellum is a centre for the registration of certain impressions, and for the origin of various psychical manifestations. The cerebrum is the seat of the higher mental faculties, such as thought, judgment, comparison, etc., while the cerebellum is that of the unreasoning mental processes, as love, hatred, joy, sorrow, etc. The one is the organ of sense, the other of sentiment.

This theory is a much more pleasing one certainly than that of co-ordination, and Dr. Courmont puts forth some well-reasoned arguments in support of it. We cannot go very far into these arguments in this place, but shall quote only the main points of his theorem, referring the reader to the work itself, or to the review of it in the journal above mentioned, for a fuller exposition of the subject.

The first argument is the anatomical one, that the cerebellum is similar in its general construction to the cerebrum, and though the latter is much larger and of more complicated arrangement interiorly, yet the former is relatively richer in gray matter, which is the organ of the psychical functions. It may also be noted that the cerebellum in women, in whom, with all gallantry it may be said, sentiment is relatively more developed than reason, is larger in proportion to the cerebrum than it is in man. Again, the motor fibres from the cord pass forward and enter the cerebrum, while the sensory fibres incline backward and pass into the cerebellum. Kölliker, indeed, noted these anatomical peculiarities, and remarked that they ill agreed with the modern theories relating to the motor functions of this portion of the encephalon.

Use is also made of incidental testimony furnished by physiological experiments performed with other objects in view. Thus, it was noticed by Vulpian and Ferrier that animals deprived of both cerebral hemispheres might yet experience painful sensations and give expression to various emotions,—a conclusive proof, the author holds, that the remaining intra-cranial structures, the cerebellar lobes, must be the seat of these emotions.

The main facts, however, upon which Dr. Courmont relies to establish the correctness of his theory are those furnished by clinical study and corroborated by post-mortem examination. It was the study of a case of puerperal mania which first led him to doubt the correctness of the prevailing theory of the cerebellar functions. The woman was apparently perfectly rational when speaking upon matters of fact, but became at once delirious whenever a word was spoken suggestive of sentiment or affection. If these two fundamental faculties of understanding and sentiment resided in cells of the cerebral cortex, it was difficult to understand how a circulatory disturbance such as this could affect one set of cells and leave the adjacent ones in

their normal state. It was thus that he came to the belief that the cerebellum was something more than a mere regulating switchboard for motor impulses. Dr. Folet cites a few of the clinical observations found by the author in a diligent search through the literature of the past several years, in which autopsy showed lesions of the cerebellum. One case was that of a woman, who was morbidly timid, the least thing sufficing to arouse her fears, which, in her childhood, would be expressed by screams and weeping, later by a simple trembling and flight. Yet in other ways she was rational enough, and could converse connectedly with any one of whom she had learned not to be afraid. She had not a trace of sexual feeling. On autopsy there was found to be an absence of one half of the cerebellum. A second case was that of a child, who had always exhibited an utter indifference to everything, expressing no pleasure and no pain, yet possessing normal muscular power, and replying sensibly, though in monosyllables, to any question put to her. Upon her death, at the age of 11, there was found to be a complete absence of the cerebellum. A man died, at the age of 39, who had been regarded during life as an idiot: yet he had a high degree of a certain form of intelligence. He escaped six times from the asylum in which he was confined, making his way out by means of false keys which he fabricated himself. His time was passed chiefly in reading the various reviews, and it was stated that he had a ready and sure wit in everything relating to concrete matters. He was, however, without any sentiments of honor, affection, gratitude, or the like; was a liar, a thief, and in every possible way immoral. On autopsy he was found to have had a very minute, though well-formed, cerebellum.

In a number of experiments made upon rats, M. Courmont found that when the cerebellum was removed these animals became profoundly apathetic, and showed neither fear nor anger when disturbed. Yet they were not in a stupor such as is seen after removal of the cerebral hemispheres, for they could walk about, and would approach of their own accord the vessels containing food and water. In those in whom only a part of the hind brain was removed, inflammation of the remaining portions taking place, there arose a state of exaggerated impressionability, the slightest noise sufficing to excite them beyond measure.

A number of arguments, in their way corroborative, are drawn from comparative anatomy, it being shown that the cerebellum is developed in different orders of the animal kingdom in exact proportion to the existence in them of the affections. Thus, in reptiles and fishes, in whom the sentimental faculties may be regarded as barely existent, the cerebellum is almost rudimentary. It is most developed in the ray and the dog-fish, and these, of all fishes, are precisely the ones that betray the existence of some affection in the care which they take of their young, and in the fact that the male and female couple. Next to man, the dolphins, seals, sea-lions, and other marine mammifers have the best-developed cerebellum, and this agrees with the fact that they are among the most sociable and affectionate of animals. If the cerebellum were the organ of muscular co-ordination, it ought to attain its greatest development in those animals that are the most active; yet in the squirrel it is less developed than in most other mammals.

There is much more that is interesting in Dr. Courmont's argument, as foreshadowed in the review by Dr. Folet, but we have quoted enough to show that the author is not wholly carried away with a theory, but rests his belief upon facts which he believes to be convincing, even though others may not be ready to accept all his conclusions.—*New York Medical Record*, November 14, 1891.

METHYLENE BLUE IN MALARIAL FEVER.

Struck by the affinity of methylene blue for the supposed micro-organism of malaria, Drs. Guttmann and Erlich have tested the value of this substance in the treatment of malaria, employing it in one case of tertian fever and one of quotidian ague. In both cases the attacks entirely ceased in a few days, and the plasmoids disappeared completely from the blood. These authors administered seven and a half grains daily of the methylene blue in five divided doses, the capsules being administered at intervals of three hours in the tertian fever and intervals of one hour in the quotidian fever, the administration in the latter case commencing twelve hours before the expected attack. They found that, with the exception of slight vesical irritations, this substance was well supported. The renal and intestinal excreta assumed an intense blue color, the quantity of the former being considerably increased. It does not produce albuminuria.—*Répertoire de Pharmacie*, November 10, 1891.

IODOFORM INJECTIONS IN GOITRE.

DR. KAPPER, an Austrian military surgeon, has employed in fifteen cases, with invariable success, Mosetig's plan of injecting iodoform emulsion into soft thyroid tumors. In every instance there was a diminution in the circumference of the neck amounting to from eight to ten centimetres. Antiseptic precautions were employed, and in some cases, where the tumor was of considerable dimensions, several syringefuls were injected into different parts of the parenchyma. In order to ascertain whether the needle has entered the gland, the patient is asked to swallow, when, if it has so entered, the downward movement of the syringe shows that the needle has been carried upward. In some cases the injections were repeated daily for several days, in others at intervals of a few days. In no cases were any untoward symptoms produced.—*Lancet*, October 17, 1891.

THE TREATMENT OF OTORRHŒA BY CAMPHORATED SALOL.

DR. PÉGOU recommends the use of camphorated salol in the treatment of suppurative otitis of the middle ear. He prepares this compound by mixing 20 parts by weight of powdered camphor with 30 parts of salol, and warming gently until fusion is complete, but without adding either alcohol or water. It then must be filtered and preserved in an hermetically-sealed green glass bottle.

Camphorated salol is an unctuous liquid, which is colorless, insoluble in water, very soluble in ether, chloroform, and oils. It readily decomposes when exposed to the air or the light.

The author's mode of employment is to first thoroughly cleanse the external auditory canal and tympanum, and then introduce into the ear a small pledget of absorbent cotton impregnated with the camphorated salol. This should not be allowed to remain more than twenty-four hours, or even twelve hours, if suppuration is abundant, and the dressing should be applied every two days. During the intervals the ear should be well syringed out with warm solution of boracic acid. According to Dr. Pégou this mode of application of camphorated salol, when associated with appropriate general treatment, will, in the large majority of cases, cure most forms of suppurative otitis, the treatment rarely lasting longer than three weeks. In the most rebellious cases, however, the camphorated salol may only be expected to reduce the quantity and offensiveness of the secretion. Camphorated salol is neither painful nor irritating when so employed, and in the author's opinion is far preferable to all other remedies hitherto employed in the treatment of otorrhœa.—*Les Nouveaux Remèdes*, September 24, 1891.

COFFEE AS AN ANTISEPTIC.

The experiments of Luderitz, of Vienna, tend to establish the belief in the antiseptic properties of coffee. A strong solution of coffee, for example, ended the career of a bacillus of typhoid in about twenty-four hours, the active streptococcus of erysipelas in twelve hours, while not longer than from three to four hours was sufficient to kill the malignant comma bacillus of cholera. Stronge decoctions acted more quickly still; the effects, however, are stated to be due more to the products of the roasting of the coffee than to the active principle of the berry. In this connection, it has been pointed out by a correspondent of the *Indian Medical Gazette* that it would be worth while to substitute coffee for tea among the cases of enteric fever in the European military hospitals in India. Coffee also might be given a trial in the treatment of cases of typhoid fever in this country. As a beverage, doubtless, it would be appreciated by the patient, and in the light of Luderitz's researches there is just the possibility that it might have some controlling influence over the disease.—*Medical Press*, September 9, 1891.

RAISING CHILDREN IN BRAN.

This method was proposed by M. PUE at the *Société Normande d'Hygiène Pratique*. It consists of a cradle which has the wooden bottom taken out, and is then lined with a strong cloth. In this is placed sterilized bran to nearly half a yard in depth. A hair pillow is used. The baby has only a short flannel shirt on, and is naked from the navel downward. It is covered with a woollen blanket, and a wool-lined dress is kept to put it in when taken up for nursing. It has thus full liberty of movement in all its limbs, while its dejections pass at once into the pure bran, keeping the child dry and clean, even if there is diarrhœa. This method is a cheap one, the bran not costing as much as diapers.—*Boston Medical and Surgical Journal*, October 15, 1891.

A NEW TREATMENT OF TYPHOID FEVER.

Dr. Tordeus prescribes antifebrin associated with resorcin in doses of from 3 to 5 grains dissolved in dilute alcohol. Sometimes he employs thymic acid, in doses of 7½ grains, combined with the two preceding substances, the preparation being given in teaspoonful doses every three hours. The author maintains that by this mode of treatment the temperature is markedly reduced, bodily strength is preserved, loss of weight does not occur, and the association of these remedies enables them to be employed in such small doses that they are practically innocuous. This combined method of antipyretics and antiseptics can, however, hardly replace either the treatment with quinine in large doses—15 to 20 grains to a child over 5 years of age—or the treatment with cold baths, since recent researches, especially of Roque and Weil, seem to show that the toxic matters of typhoid fever are more rapidly and more completely eliminated under the influence of cold baths than by any other method.—*Revue des Maladies de l'Enfance*, November, 1891.

BENZINE AS A PREVENTIVE OF TRICHINOSIS.

Dr. Putter, Jr., of Stralsund, reports in the *Deutsche Medicinische Wochenschrift* on the favorable effect of benzine after the consumption of pork full of trichinæ A pig had just been killed, and some hours after twenty-seven people had eaten of the meat the inspector informed the owner that the animal had been suffering from trichinosis. All the twenty-seven people, adults and children from 14 to 17 years, had boiled pork for dinner; the wife of the owner and four other women, in making sausages, had repeatedly tasted the raw material. Dr. Putter was informed of the mishap on the same evening, and prescribed two hundred and seventy gelatin capsules, each to contain 7½ grains of benzine, each person to take five capsules the next morning before breakfast, and an hour later a large teaspoonful of pulv. rhei and pulv. glycerrhizæ co. in equal parts, the children, of course, less in proportion. The same dose was to be repeated in the afternoon, and the purgative only the next day. The benzine was well borne by all the patients, a few only complaining of malaise and eructations, but none of them vomited. Eight months later all the twenty-seven people were still perfectly healthy, as were the women who had tasted the raw sausages. Dr. Putter is so convinced that his treatment alone prevented the people from being attacked by trichinosis that he recommends it warmly in all similar cases.—*Lancet*, October 17, 1891.

THE CARDIAC ACTION OF CACTUS GRANDIFLORA.

Dr. E. Boinet terminates an elaborate experimental study as to the physiological action of cactus and its active principle with the following conclusions (*Bulletin Général de Thérapeutique*, October 30, 1891):

In ten minutes after the injection of the first dose in frogs the cardiac energy increases, but this systolic increase in energy is transitory, although it may be continued with the repetition of the dose. With large doses the pulse is slowed, and in the final period of the poisoning is accompanied by disturbed rhythm. Tactine is further stated to produce the stimulating effect on the heart in a more marked and more permanent degree than the extract of cactus, and, unlike the latter, does not lead to slowing of the pulse. In his clinical experiments the author found that 40 drops of the tincture of cactus are without effect, although in cases of disturbed compensation in various forms of heart-disease 80 to 100 drops acted as a valuable cardiac stimulant.

In cases of nervous disturbance of the cardiac rhythm 80, 100, or 120 drops were given daily for weeks at a time, and are said to have greatly improved the regularity of the heart's action without the production of any evidences of accumulation.

ECZEMA AS A CONSEQUENCE OF THE EXTERNAL USE OF SALOL.

Salol, even in doses of 60 to 90 grains, is well tolerated by the digestive mucous membrane, but when employed externally on a mucous surface it is apt to produce eczematous inflammations; thus two cases have recently been reported by Dr. Cartaz in which insufflations of powdered salol were employed after nasal operations. In both cases marked eczematous eruption resulted on the external nares and upper lip, and in one case extended over a great part of the face. A similar eruption was also produced in a third case suffering from rhinitis with ulcerations of the external nares, in which a ten-per-cent. salol ointment in vaseline was em-

ployed. The author explains these results as attributable to the decomposition of the salol into its two components, phenol and salicylic acid, produced under the influence of fatty bodies. In the cases under consideration its decomposition was probably produced by the sebaceous secretion of the skin.—*Les Nouveaux Remèdes*, November 8, 1891.

THE LAW OF PERIODICAL FUNCTION IN WOMEN.

OTT (*Wiener Med. Presse*, February 8, 1891) reports some observations, not exclusively upon menstruation, but upon the various vital processes occurring in women during the period of generative activity. These processes correspond in time to the hemorrhage, —are associated conditions, with a dependent relation to it. Observations upon temperature, pulse, and blood-pressure indicated that vital activity attained its maximum preceding the menstrual period, and declined at its commencement or immediately before. Sphygmographic tracings, muscle strength, and excretion of urea suffer similar variations. Observations were made at a certain hour each morning during prolonged periods, sometimes extending into the menstrual periods, upon heat radiation, muscle strength, pulmonary capacity, inspiratory and expiratory force, the tendon reflexes, in healthy women placed under the same condition; and a physiological functional periodicity of the female organism was demonstrated. To establish the connection between menstruation and this periodicity of function, it is necessary to determine if the rhythmical variations are independent of menstruation. A large number of observations made by Dr. Schichareff, under the guidance of Ott, upon pulse, temperature, and blood-pressure in girls between the ages of 8 and 13, and in women between the ages of 58 and 80 years, showed that no such periodical variations of physiological functions occur in females during the periods in which they are not capable of conceiving, and in which they do not menstruate.—*Archives of Gynæcology*, September, 1891.

ICHTHYOL IN THE TREATMENT OF ERYSIPELAS.

DR. KLEIN recommends the employment of ichthyol in the treatment of erysipelas. In such a disease as erysipelas, whose duration may vary between such wide limits, whose evolution may be subject to such great variations, and whose severity may be either slight or serious, it is very difficult to estimate the character of the results attributable to any remedy.

Dr. Klein has, however, restricted his conclusions to observations made on severe cases of erysipelas, and they are published in the *Gazette Médicale de Paris*, October 3, 1891:

1. Ichthyol undoubtedly exerts marked influence on the development of the micrococcus of erysipelas in the skin, which may be attributable either to the reducing action which this remedy exerts on the tissues, or to a direct action exerted on the pathogenic micro-organisms, or to both of these causes.

2. Treatment by ichthyol reduces the duration of erysipelas at least half.

3. Treatment need not be continued, as a rule, longer than three or four days. By this time the disease is usually cured.

4. Under the influence of ichthyol the disease follows a much more benign course.

ZINC GLUE FOR STIFF SURGICAL DRESSINGS.

TREUTLER recommends a preparation, first suggested by Unna, for obtaining stiff surgical dressings, such as are applied to fractured or dislocated limbs. It is as follows:

Oxide of zinc, 10 parts;
Gelatin, 30 parts;
Glycerin, 30 parts;
Water, 30 parts.

This is thickly applied and rubbed into the muslin or gauze forming the bandage. A thinner preparation contains 20 parts of gelatin and 40 parts of water, the other ingredients remaining the same.—*Quarterly Therapeutic Review*, October, 1891.

THE POINT OF ELECTION FOR PUNCTURE OF THE ABDOMEN.

As is well known since the time of Munro, puncture of the abdomen is made in the centre of a line passing from the umbilicus to the antero-superior iliac spine. TRZEBICKY, who in following this rule in one case was annoyed by serious hemorrhage from the epigastric artery, has studied on thirty-six different cadavers the relationship of this artery and the line of Munro. He concludes that in a great majority of cases puncture made in the middle of Munro's line will not strike the epigastric artery, but in a certain number of cases

the trocar may wound either the epigastric artery or one of its branches. Since the epigastric artery is found in the sheath of the abdominal rectus muscle, the point of selection for puncture must depend upon the situation of this muscle, especially when it is markedly stretched by the abdominal effusion. From an anatomical point of view, puncture in the linea alba is the least objectionable, but if the line of Munro is preferred, the puncture should be made on the level of the external half of this line.—*La Tribune Médicale*, October 22, 1891.

THE CONSTITUTION OF ANTISEPTINE.

Still another substance introduced by Radlauer as a definite chemical compound has turned out to be simply a mixture. This has already been shown to be the case as regards somnal and antinervine, and now DR. GOLDMANN shows, in *Les Nouveaux Remèdes* for October 8, 1891, that antiseptine, which is claimed to be a chemical combination, with a constitution of an iodo-boro-thymolate of zinc, is nothing but a mixture of the iodide of zinc (2½ parts), thymol (2½ parts), boracic acid (10 parts), and sulphate of zinc (85 parts).

THE ANTIRHEUMATIC PROPERTIES OF EPHEDRA VULGARIS.

Ephedra vulgaris enjoys considerable reputation among the Russian peasantry as a domestic remedy in rheumatic affections, and it has recently been experimented with by DR. BECHTINE in the clinical service of Professor Popow. His results seem to show that this remedy is possessed of considerable virtues in the treatment of both acute and chronic rheumatism.

The author employed this remedy in the form of a decoction of sixty grains of the powdered twigs and roots in about seven ounces of water, the dose being a tablespoonful every two hours. Dr. Bechtine states that the therapeutic effects of this drug are especially marked in cases of acute articular and muscular rheumatism, where its effects are manifested on the second day of treatment by considerable relief from pain and diminution of the fever, frequency of respiration, and pulse. He states that after a few days the articular swelling entirely disappears, and that after eight or ten days the patient may be considered cured. Even in cases where pericarditis existed as a complication this also is stated to have disappeared under treatment. In chronic rheumatic affections, the author states that the therapeutic action of ephedra is less favorable and more slowly produced; though here also he has obtained marked improvement, which, however, in the majority of cases, was only transient.

In addition to its antirheumatic properties, according to Dr. Bechtine, ephedra possesses a certain amount of laxative power, and is, besides, an active diuretic. As is well known, ephedrine, the alkaloid of *Ephedra vulgaris*, first isolated by Professor Nagai, of Tokio, is a marked mydriatic.

INTESTINAL ANTISEPSIS.

DR. DUJARDIN BEAUMETZ recommends in *Les Nouveaux Remèdes* for November 8, 1891, the following formula as a satisfactory intestinal antiseptic:

Salol,
Salicylate of bismuth,
Bicarbonate of sodium, āā 150 grains.

To be divided into thirty powders in capsules. One capsule to be taken before breakfast and before dinner.

TREATMENT OF INJURIES TO THE HEAD.

DR. SENGER, of Crefeld, has proposed a new method of treatment with the object of facilitating repair in suppurating wounds of the head, with exposure of the cranium. He first arrests the phlegmonous and puriform process by surgical and antiseptic treatment,—that is, by incisions, drainage, and dressing,—and so reduces the complicated injury to a simple cranial wound, which, of course, still produces a certain quantity of pus every twenty-four hours. A wet antiseptic dressing is then applied to the wound for two or three days, and when this is taken off the first layer of the tabula externa is removed with the help of a small chisel, in little scales, until drops of blood are seen in the bone. In from two to three days granulations protrude from the bone, and entirely cover it in from eight to ten days, and healing subsequently progresses as in other wounds. Suppuration ceases in proportion to the growth of the granulations. It is also possible to produce granulations by drilling several small holes in the external table until blood is seen; but the chisel is preferable, as it is difficult to estimate the depth of the drill-

hole, and the drilling takes more time than the chiselling. A still more serious objection to the former is that the holes get filled up with bone-dust. In neither method is it necessary to give an anæsthetic, as but little pain is felt during the trifling operation.—*Lancet*, November 7, 1891.

A NEW TREATMENT FOR COMPOUND FRACTURES.

According to the London correspondent of the *New York Medical Record* (November 14, 1891), MR. MANSELL MOULLIN read a paper before a recent meeting of the Clinical Society of London in which he advocated the treatment of compound fractures into joints by immersing the injured part in a bath of corrosive sublimate at the temperature of the body. If the accident were recent and the wound clean, the strength of the solution should be 1 in 10,000, with a few drops of hydrochloric acid added, and two hours' submersion night and morning would be sufficient. If, on the other hand, the injured part was foul, or some time had elapsed, and inflammation had already set in, the bath should be continuous, night and day, for forty-eight hours, and the strength of the solution should be 1 in 1000 for the first two. Over thirty primary cases of severe injury had been treated in this way with perfect success, except in two instances, in both of which the failure was traced distinctly to an escape of sewer-gas. Almost the same could be said of the secondary cases; but in one, in which a period of five days had been allowed to elapse, a secondary abscess formed (without a rigor or other sign of pyæmia) in the iliac fossa on the opposite side of the body.

THE "KEELEY CURE" AGAIN.

The *Medical Age* has the following on this "treatment":

"The so-called bichloride of gold treatment of inebriety, for which so much has been claimed, and to which the newspaper press has given such prominence, proves to be a rank humbug. Bichloride of gold, though a chemical possibility, is impossible therapeutically, as the preparation reduces and becomes inert the moment the chemical bichloride transformation is effected.

"It is stated that the remedies employed by the manager of the institution which has been chiefly identified with this treatment, at Dwight, Illinois, are the hypodermic use of cocaine and administration by mouth of the so-called bichloride of gold, which a recent analysis reveals to be a weak solution of aloin in water combined with comp. tr. cinchona. The only gold used in the treatment is that supplied by the dupes in the form of fees.

"The favorable effects of this treatment are in part due to the action of cocaine, but chiefly to the mental effect on the patients, who, emotionally stimulated by faith in the promised cure, are enabled to gain temporary control of their habit. The lay and religious press have given the chief quack and his humbug an amount of free advertising beyond computation.

"The secretary of the State Board of Health of Illinois is authority for the statement that the manager of this institution at Dwight was refused a license to practice medicine in Illinois."

CRESOL-IODIDE.

DR. PETERSEN has made experiments with this new medicament in Seiffert's clinic, and recommends it as a good application for diseases which are combined with increased secretion, such as rhinitis hyper-secretoria, eczema narium, etc.—*Journal of Laryngology*, October, 1891.

THE REFLEX ACTION OF THE TRIGEMINUS AS A THERAPEUTIC AGENT.

DR. KURT, in the *Deutsche Medicinal Zeitung* of May 7, suggests a method for controlling spasmodic conditions due to motor neuroses. Recognizing the fact that the application of certain irritants to the peripheral endings of the trigeminus, particularly at the conjunctiva and the nasal mucous membrane, retards reflex motor action, he takes advantage of this therapeutic principle to utilize such drugs or medicaments as antipyrin, quinine, and sugar. These he dusts with a camel's-hair pencil either in the eye or nasal mucous membrane, and asserts that he can thereby control the spasm of whooping-cough, laryngo-spasm, facial contractions, and some forms of epileptic attacks.—*Journal of Nervous and Mental Diseases*, October, 1891.

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ARISTOL.

DR. ALOIS POLLAK (*Therapeut. Monatsh.* xii. 1890) recommends Aristol as an antiseptic and as a remedy in various skin-diseases on the ground of experiments made in numerous cases. Inasmuch as this substance is insoluble in water, he employed it chiefly as a dusting powder, or in ethereal solutions or ointments. For obvious reasons, it cannot be utilized for disinfection of the hands, instruments, and the site of operation, or as an antiseptic during the operative procedure. On the other hand, it is very serviceable for the treatment of wounds after operations, or of neglected injuries. It has the great advantage of being effective in small quantities, so that wounds need only be covered with a thin layer; if desired, it may be diluted with sugar of milk. In all the cases treated by the author with Aristol, the healing process took place without reaction. Fever never occurred, and if present before operation, it disappeared regularly within the first few days after its performance. There was an entire absence of pains, granulations were developed with remarkable rapidity, and formation of epithelium took place promptly. The period of healing was remarkably short.

The cases treated with Aristol comprise the following:

1. Anal fistula; incision and curetting; tamponing with Aristol gauze after previous application of the powder. Cure in twenty days. 2. Abscess in the gluteal region of the size of a fist; incision and insufflation of Aristol. Healing accomplished in seven days. 3. Lymphadenitis of the neck (tuberculous?); incision; extirpation; curetting; application of Aristol in powder and tampons. Eight days later, fresh nodules in the granulations and cicatrix. After a second enucleation, and the use of Aristol, healing took place. 4. Periostitis of the mastoid process; incision; curetting, followed by application of Aristol powder. Cure on the eleventh day. 5. Injury of the thigh by a rusty nail; wound has a discolored, suspicious appearance; is covered by gray, necrotic granulations; curetting, and application of five-per-cent. Aristol ointment. Cured in fourteen days. 6. Necrotic ulcer in consequence of a contusion; incision of the undermined margins; application of Aristol powder. Healing ten days later.

In addition to these cases, which are reported in full, the author mentions four minor operations for tumors, three extractions of foreign bodies, a wound inflicted by a pen dipped in ink, a lacerated wound of the scalp with exposure of the bone, three cases of purulent adenitis, three phlegmons, and several cases of buboes, all of which were successfully treated with Aristol.

As regards the employment of Aristol in the treatment of cutaneous diseases, he cites the following cases:

Eczema scrofulosum. Among ten cases, no curative effect was produced in six, in the remaining four it was slight. Hence Aristol is not to be recommended in this disease.

Eczema marginatum. In this affection an excellent result was obtained, especially in old neglected cases, from the use of a ten-per-cent. ointment with vaseline.

Varicose ulcer. A five-per-cent. ointment of Aristol and vaseline was employed with advantage.

Pernio. In the majority of cases a ten-per-cent. solution of Aristol in collodium; and later, Aristol plaster proved very effective.

Owing to its convenient manner of application, Aristol seems especially applicable for the physician's use in his office practice. *Deutsche Medizinal Zeitung*, April 2, 1891.

Wines and Liquors for Medicinal Use.

Contributed to the "Rocky Mountain Druggist" for September, 1891, by Niel Dahl, Ph. G., Pharmacist and Manufacturing Chemist, Denver, Colorado.

"Whenever we sell whisky, brandy, or wines for medicinal use, we are supposed to sell goods that are pure and unadulterated, as much so as we are supposed to sell pure and unadulterated glycerine, iodide of potassium, quinine, calomel, and other medicines, because, the former, when properly used, can lay claim to as many medicinal attributes as the latter, and, notwithstanding the abuse they are subjected to as beverages by men who cannot control themselves, are as valuable parts of our Materia Medica as any other series of preparations. To us they are serviceable adjuvants, and to the physicians appreciated and valuable remedies. They ought, therefore, to receive the same care and scrutiny on our part as other medicines.

"From recent experience and investigations, I am, however, led to believe that such is not the case, and that pharmacists, as a rule, are ignorant of whether they sell pure and unadulterated liquors and wines or not. *I will also dare to make the statement that nine-tenths of the liquors and wines sold in Colorado are more or less adulterated and compounded.*

"I shall begin the illustration of these statements by quoting the following letter addressed to a well known house in Cincinnati, Ohio:

"'Gentlemen,—The whiskies you sent me are, I am sorry to say, very unsatisfactory.'

"'I bought, according to samples, ten years old, absolutely pure whiskies.'

"'The United States Pharmacopœia, as a standard for whiskies, allows them to contain as a maximum (they may contain less), not more than twenty-five centigrammes dry residue in 100 cubic centimeters (one-quarter of one per cent.). This will correspond to 9.46 grammes to the gallon. Any solid matter above this is adulteration. Your so called Blended Rye Whisky contains in 100 c. c. 0.65 grammes dry residue, and in one gallon 24.60 grammes, nearly three times more than it should have. In a barrel of fifty-one gallons it would amount to 1267.0 grammes, at least 27½ ounces Av. dry matter too much.'

"'Your Bourbon Whisky contains in 100 c. c. 0.55 grammes dry residue, over twice as much as the Pharmacopœia allows it to have.'

"'These analyses show your whiskies to be adulterated and compounded, and not the whiskies your representative pretended to sell to me.'

"A later analysis of this whisky gave distinct reactions of fusel oil, according to Betelli's, Bouvier's, and Vitali's tests, showing that they had not even gone to the trouble of using deodorized alcohol in the compounding, presumably thinking that none would be the wiser.

"I next analyzed another brand of whisky that had been sold largely in Denver as straight ten-year-old Ripy Kentucky Bourbon, and found it to contain 0.35 grammes dry residue in 100 c. c. It also gave reactions of fusel oil.

"Another whisky gave a dry residue of 0.57 grammes in 100 c. c., and tests also proved it to contain fusel oil and valerianate of ammonium.

"One of the domestic brandies, largely advertised as a fine product especially adapted for medicinal use, and that is mainly sold in drug stores, proved to contain 0.55 grammes dry residue in 100 c. c., but no fusel oil.

"*I next examined a whisky distilled by Hiram Walker & Sons, of Walkerville, Canada, and known as Canadian Club Whisky. This whisky proved to contain only 0.13 grammes dry residue in 100 c. c., about one-half of what the Pharmacopœia allows, and this residue had not the sticky appearance and sweetish taste that characterized the other samples, nor did it give any reaction for fusel oil. In other words, it proved to be an absolutely pure whisky.*"

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is bottled only by the distillers, in bond, and under the supervision of the excise of Canada, and every bottle is guaranteed genuine by a government stamp over the capsule, which certifies to the age of the contents. If not procurable from wholesale houses send your orders direct to

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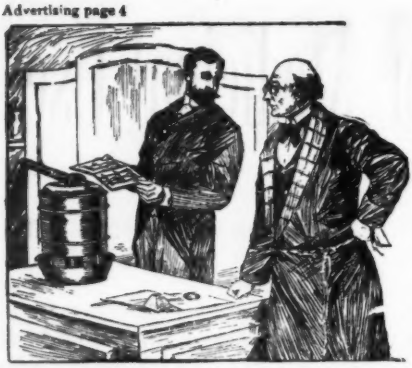

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This Sterilizer is used by Harvard, Yale, College of Physicians and Surgeons, New York City, University of Pennsylvania, Johns Hopkins University and Johns Hopkins Hospital, and many other prominent institutions, and hundreds of physicians and thousands of families who are unanimous in its praise. We shall be happy to send any physician full particulars regarding its use on application.

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The Piston (**A**) is **Hollow** its entire length, forming a receptacle for tablets.
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No bottle or spoon required.
Strictly first-class and **Standard Form** of needles used.
Being hermetically sealed, when in the case, the piston is always moist and ready for use, and easily kept strictly antiseptic.

THE CASE (**Figs. 2 and 3**) is very attractive, being new, novel, and elegant. Made of polished hard rubber.
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A moment's study of the above cuts will give a clear understanding of this

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Lanoline.—Lanoline is the purified fat obtained from sheep's wool, is natural to the hair and skin, and is absorbed by these at once. It is the best basis known for ointments, salves, etc. It is odorless, almost white, perfectly miscible with water and all medicaments. We supply also an Anhydrous Lanoline, Toilet Lanoline in tubes, Lanoline Soap, Lanoline Cold Cream, and Lanoline Pomade.

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It has been demonstrated by the recent researches of Dr. GOTTSTEIN (Berliner Klin. Wochenschr., Nov. 28, 1887), Dr. C. FRAENKEL (Centr. Bl. für Bacteriologie, 1887, Bd. 5), and by Dr BURSCHINSKY (Deut. Med. Zeit., 1886, p. 1026), that pure Lanoline is free from any bacterial germs, and that it does not sustain the growth of any micro-organisms.

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Insomnia may be dependent upon derangement of the nervous, circulatory, respiratory or urinary organs, the alimentary tract, the liver, or upon febrile or general disease. It may also be caused by unhygienic conditions of heating, lighting, ventilation, diet, occupation.

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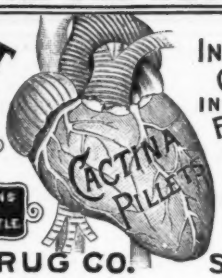

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Respiratory diseases are always endemic, and at certain seasons of the year epidemic. Many a successful patent-medicine man owes his fortune to a happy or unhappy combination of cough remedies, and not a small portion of the regular physician's practice is made up of prescribing "cough mixtures." How many of those generally in use accomplish much more than to disturb the digestion or nauseate the patient we leave it to the experience of all fair-minded physicians to determine. It is certain many of these mixtures are inefficient.

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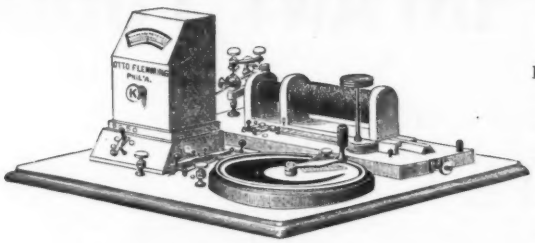

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Which is of full strength, yet SWEET in taste, the bitter principle being entirely masked. Thousands of physicians have tested it and are prescribing it daily. It is the ONLY liquid preparation of Cascara, of concentrated dose, applicable to cases of delicate women and children to whom the intense bitterness of the ordinary fluid extract is nauseating to a prohibitory degree.

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For the treatment of

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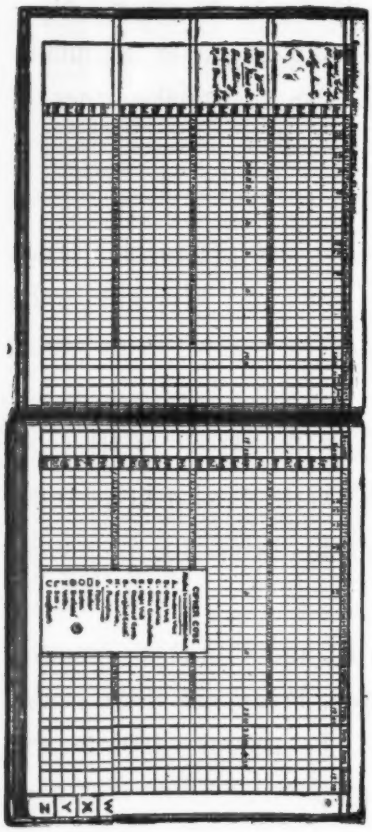

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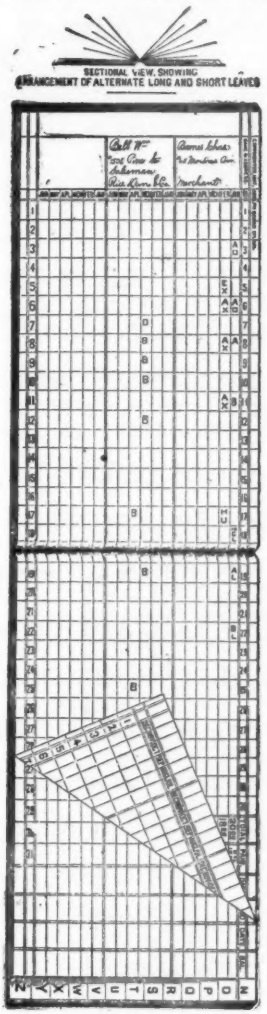

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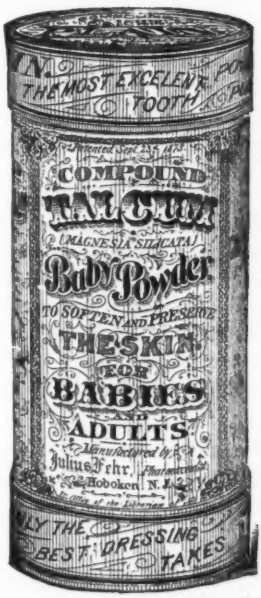

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The prescribed dose produces a feeling of buoyancy, and removes depression and melancholy; *hence the preparation is of great value in the treatment of mental and nervous affections.* From the fact, also, that it exerts a double tonic influence, and induces a healthy flow of the secretions, its use is indicated in a wide range of diseases.

NOTICE—CAUTION.

The success of Fellows' Syrup of Hypophosphites has tempted certain persons to offer imitations of it for sale. Mr. Fellows, who has examined samples of several of these, ***finds that no two of them are identical,*** and that all of them differ from the original in composition, in freedom from acid reaction, in susceptibility to the effects of oxygen when exposed to light or heat, ***in the property of retaining the strychnine in solution,*** and in the medicinal effects.

As these cheap and inefficient substitutes are frequently dispensed instead of the genuine preparation, physicians are earnestly requested, when prescribing the Syrup, to write "Syr. Hypophos. ***Fellows.***"

As a further precaution, it is advisable that the Syrup should be ordered in the original bottles; the distinguishing marks which the bottles (and the wrappers surrounding them) bear, can then be examined, and the genuineness—or otherwise—of the contents thereby proved.

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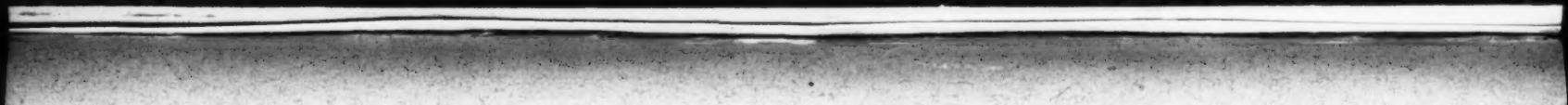
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